ASSIGNMENT –

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Writecodeandconnectionsinwokwiforultrasonicsensors.

Wheneverdistanceislessthan100cmssend"alert"toibmcloudanddisplaydevicerecent events.

Code:

```
#include<WiFi.h>#include
<PubSubClient.h>WiFiClie
nt wifiClient;Stringdata3;
#defineORG"4yi0vc"
#define                DEVICE_TYPE
"nodeMcu"#define       DEVICE_ID
"Assignment4"#defineTOKEN"1234
56789"
#definespeed0.034
#defineled14
char server[] = ORG
".messaging.internetofthings.ibmcloud.com";charpublishTopic[]=
"iot-2/evt/Data/fmt/json";
char topic[] = "iot-
2/cmd/home/fmt/String";charauthMethod[]
= "use-token-auth";chartoken[]=TOKEN;
charclientId[]="d:"ORG":"DEVICE_TYPE":"DEVICE_ID;
PubSubClientclient(server,1883,wifiClient);voi
dpublishData();
constinttrigpin=5;
constintechopin=18;
Stringcommand;
Stringdata="";

long
duration;float
```

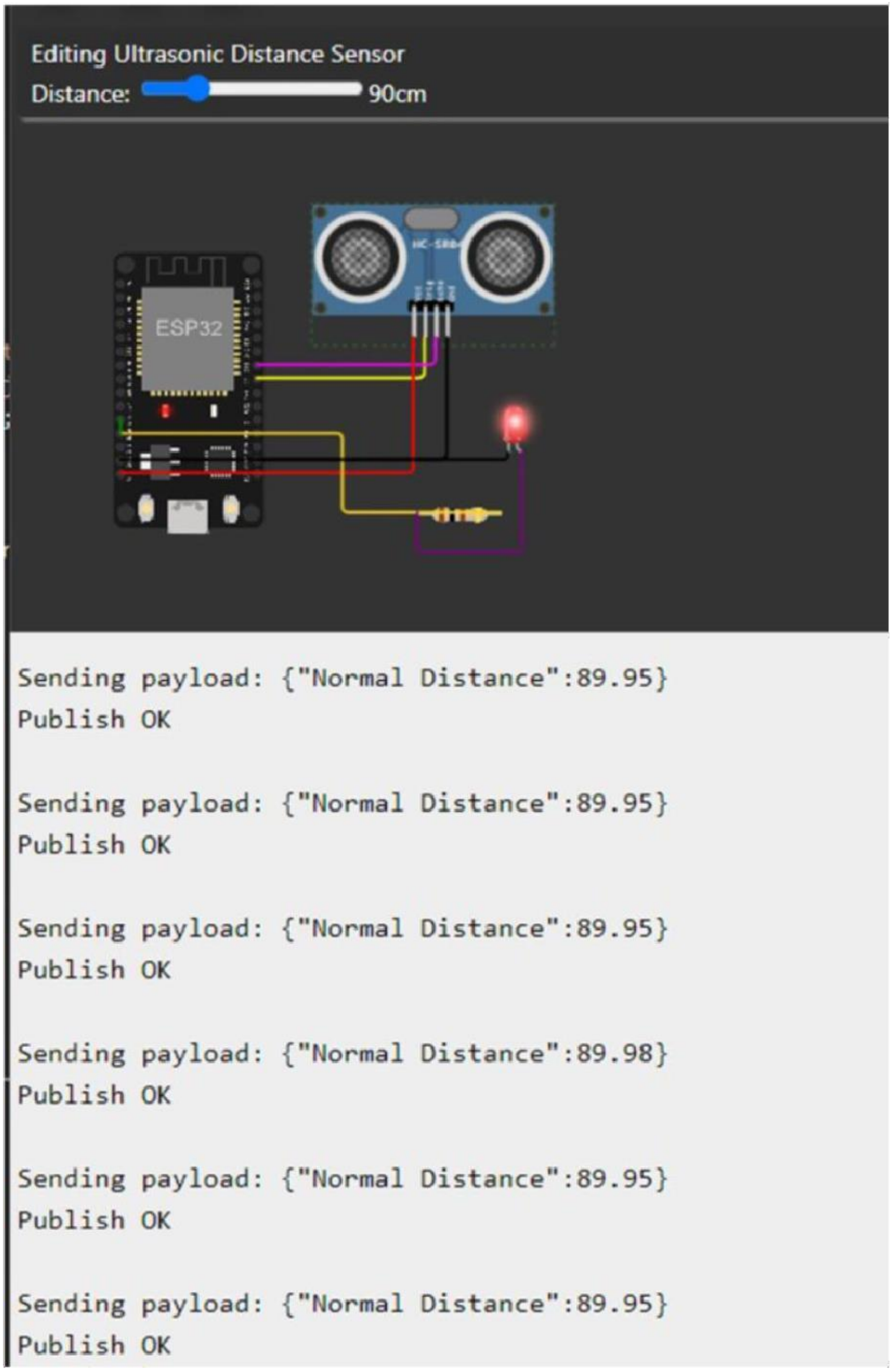
dist;

```
voidsetup()
{
  Serial.begin(115200);pinMo
  de(led,
  OUTPUT);pinMode(trigpin,
  OUTPUT);pinMode(echopin
  ,
  INPUT);wifiConnect();mqtt
  Connect();
}

voidloop(){
  bool   isNearby   =   dist   <
  100;digitalWrite(led,
  isNearby);publishData();
  delay(500);
if (!client.loop())
    {mqttConnect();
  }
}

voidwifiConnect(){
  Serial.print("Connecting to ");
  Serial.print("Wifi");WiFi.begin("Wokwi-
  GUEST","",6);
  while (WiFi.status() != WL_CONNECTED)
    {delay(500);
    Serial.print(".");
  }
  Serial.print("WiFiconnected,IPaddress:");Serial.println(WiFi.localIP());
}
voidmqttConnect(){
  if(!client.connected()){
    Serial.print("Reconnecting MQTT client to ");
    Serial.println(server);while(!client.connect(clientId,authMethod,tok
    en)){Serial.print(".");
      delay(500);
    }
    initManagedDevice();
    Serial.println();
  }
}

voidinitManagedDevice(){if(
  client.subscribe(topic)){
    //Serial.println(client.subscribe(topic));Serial
    .println("IBMsubscribetocmdOK");
  }else{
    Serial.println("subscribetocmdFAILED");
  }
}
voidpublishData()
{
  digitalWrite(trigpin,LOW);digital
  Write(trigpin,HIGH);delayMicros
  econds(10);digitalWrite(trigpin,L
  OW);duration=pulseIn(echopin,H
  IGH);dist=duration*speed/2;if(dis
  t<100){
    String payload = "{\"Normal
    Distance\":";payload+=dist;
    payload+="}";Ser
    ial.print("\n");
  Serial.print("Sending payload:
  ");Serial.println(payload);
  if(client.publish(publishTopic,(char*)payload.c_str())){Se
    rial.println("PublishOK");
  }
  }
  if(dist>101&&dist<111){
  Stringpayload="{\"Alertdistance\":";pa
  yload+=dist;
  payload+="}";Serial.print("\n");S
  erial.print("Sending payload:
  ");Serial.println(payload);
   if(client.publish(publishTopic, (char*) payload.c_str()))
    {Serial.println("Warning crosses 110cm -- it automaticaly of the
    loop");digitalWrite(led,HIGH);
  }else{
    Serial.println("PublishFAILED");
  }
   }
}
void callback(char* subscribeTopic, byte* payload, unsigned int
payloadLength){Serial.print("callbackinvokedfortopic:");
Serial.println(subscribeTopic);for(i
nt i=0; i<payloadLength;
i++){dist+=(char)payload[i];
}
Serial.println("data:"+
data3);if(data3=="lighton"){
Serial.println(data3);digitalW
rite(led,HIGH);
```

```
  }
  data3="";
}
```

Output:

1) **WhenDistance <100cm,itwillshownormaldistance.**

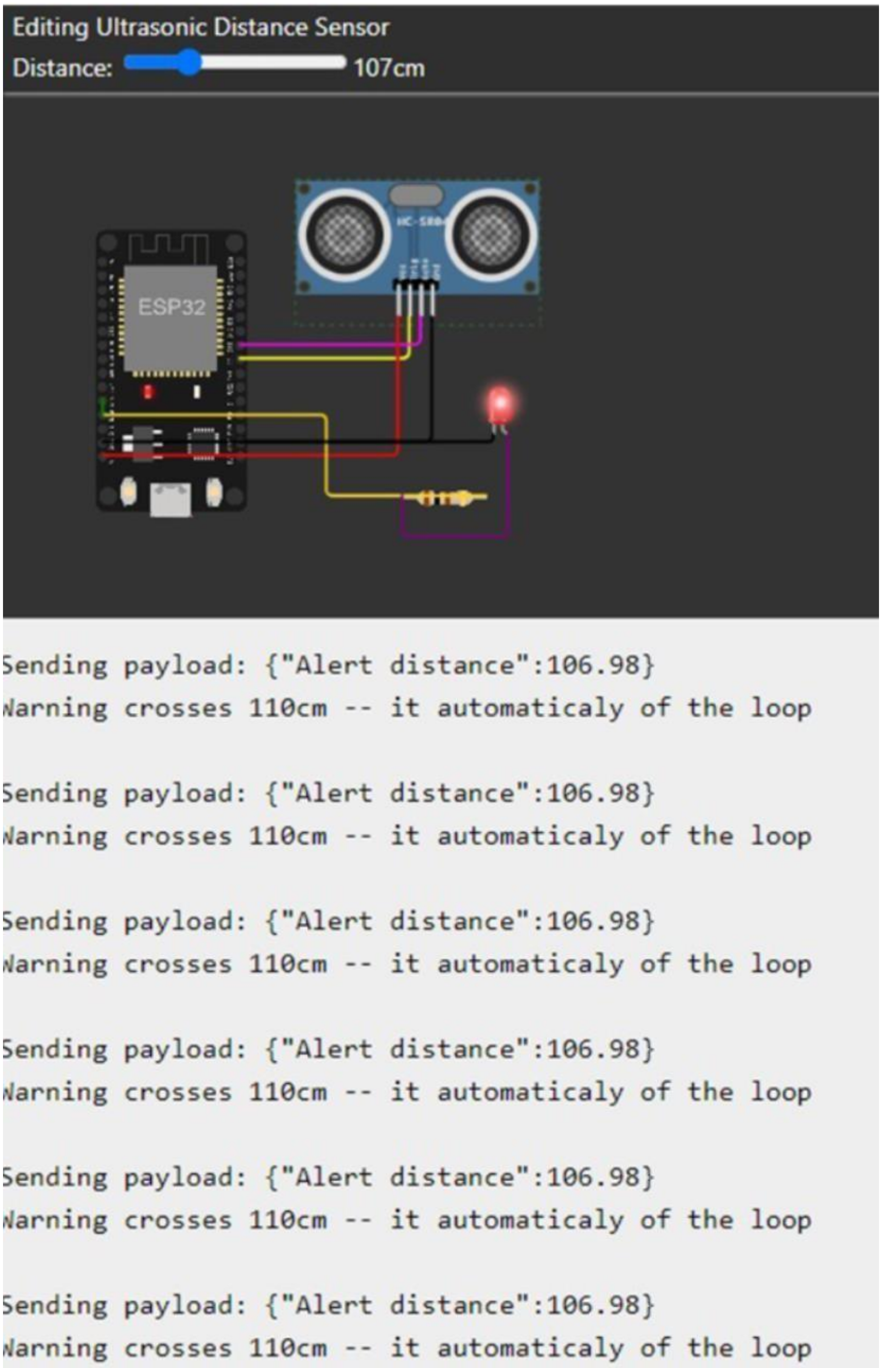


Editing Ultrasonic Distance Sensor

Distance: 90cm

```
Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.98}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK
```

2)Whendistance>100cm<110cm,alertwithwarningmessageoccurs.



Editing Ultrasonic Distance Sensor

Distance: 107cm

```
Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop

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Warning crosses 110cm -- it automaticaly of the loop

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Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop
```
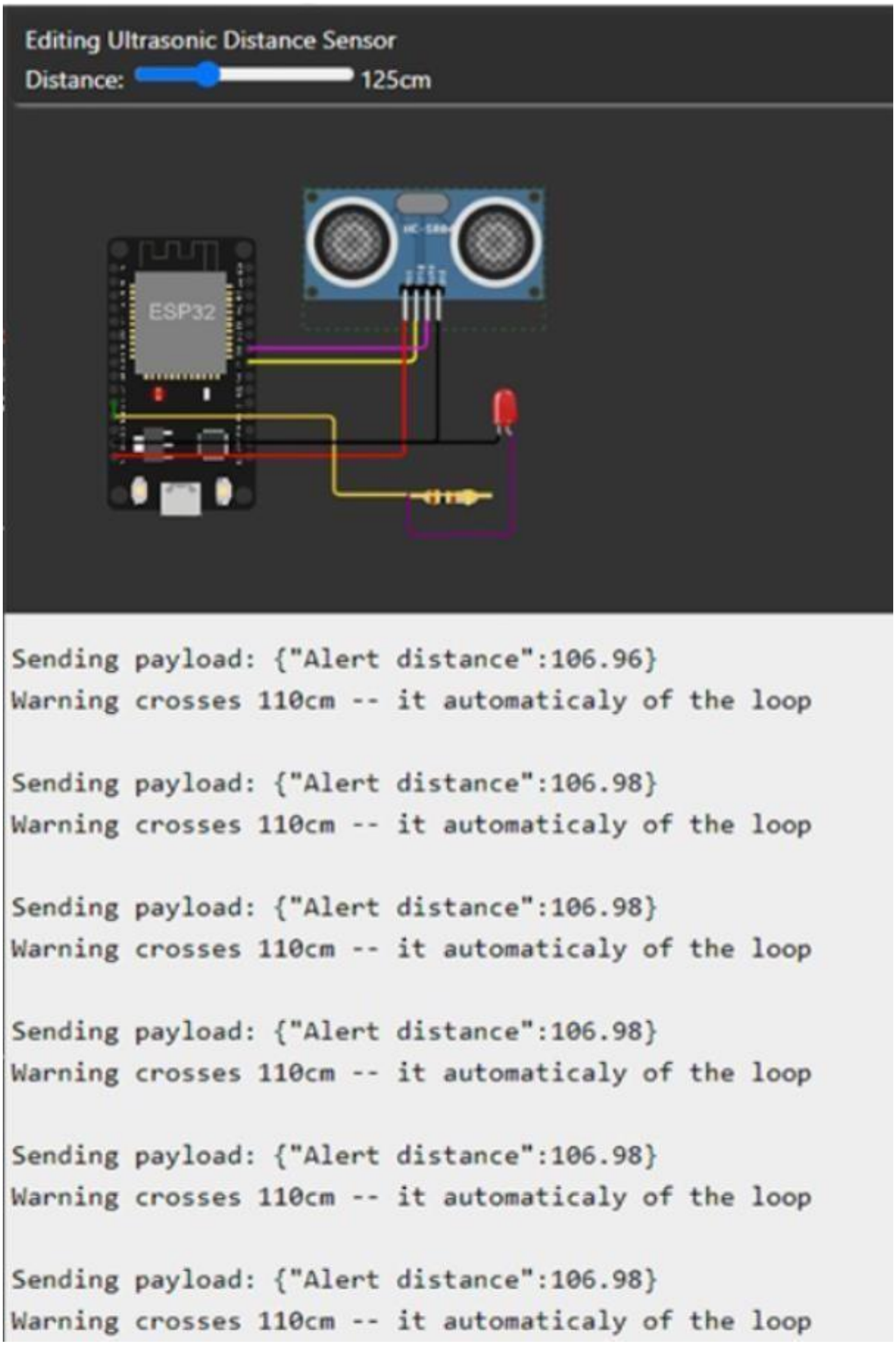

3)Whendistance>110cm,totallymovestoiffstate.



Editing Ultrasonic Distance Sensor

Distance: 125cm

```
Sending payload: {"Alert distance":106.96}
Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop

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Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop
```
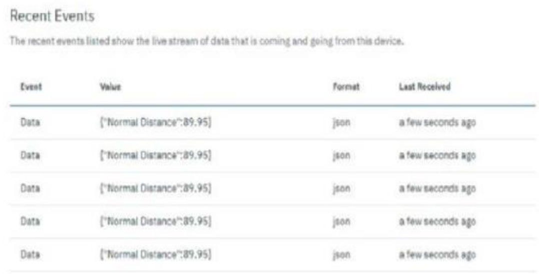
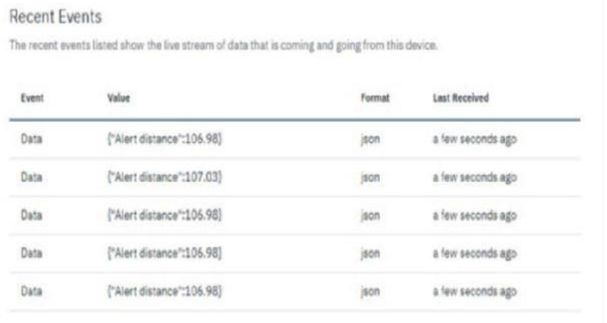

IBMCloudOutput:



Recent Events

The recent events listed show the live stream of data that is coming and going from this device.

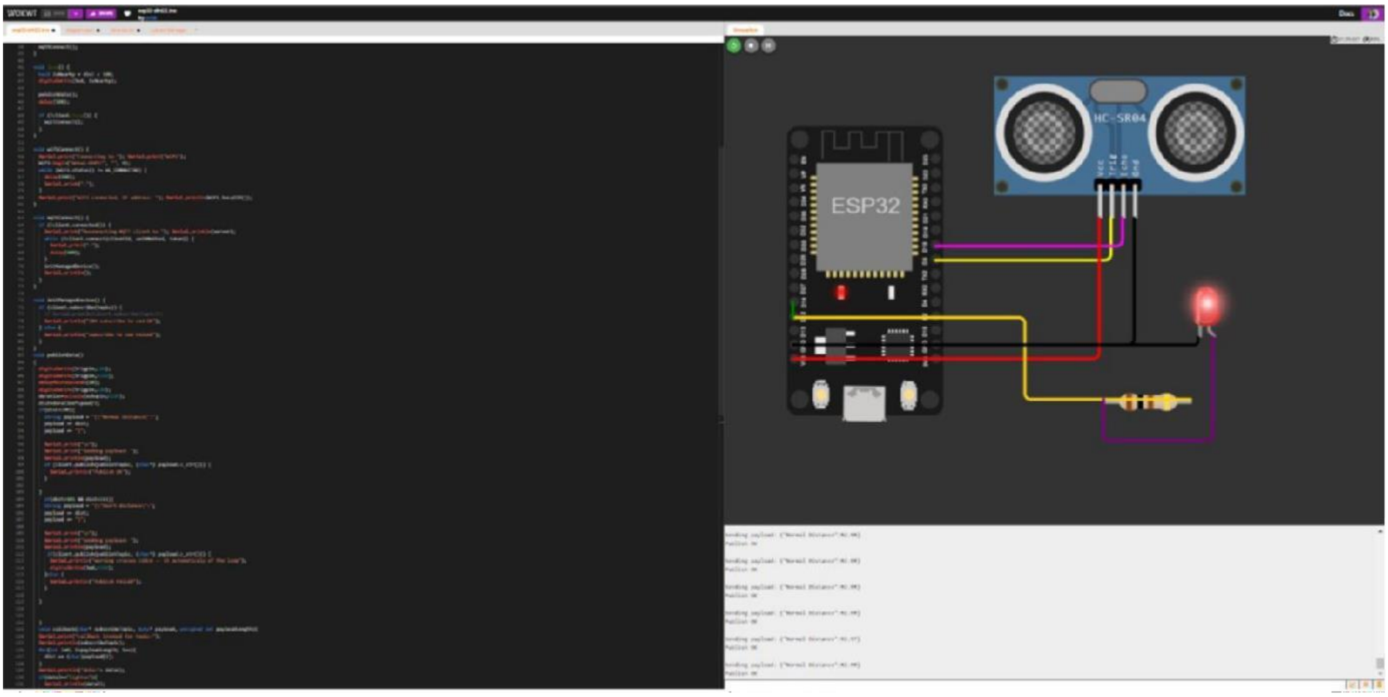
Event	Value	Format	Last Received
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago

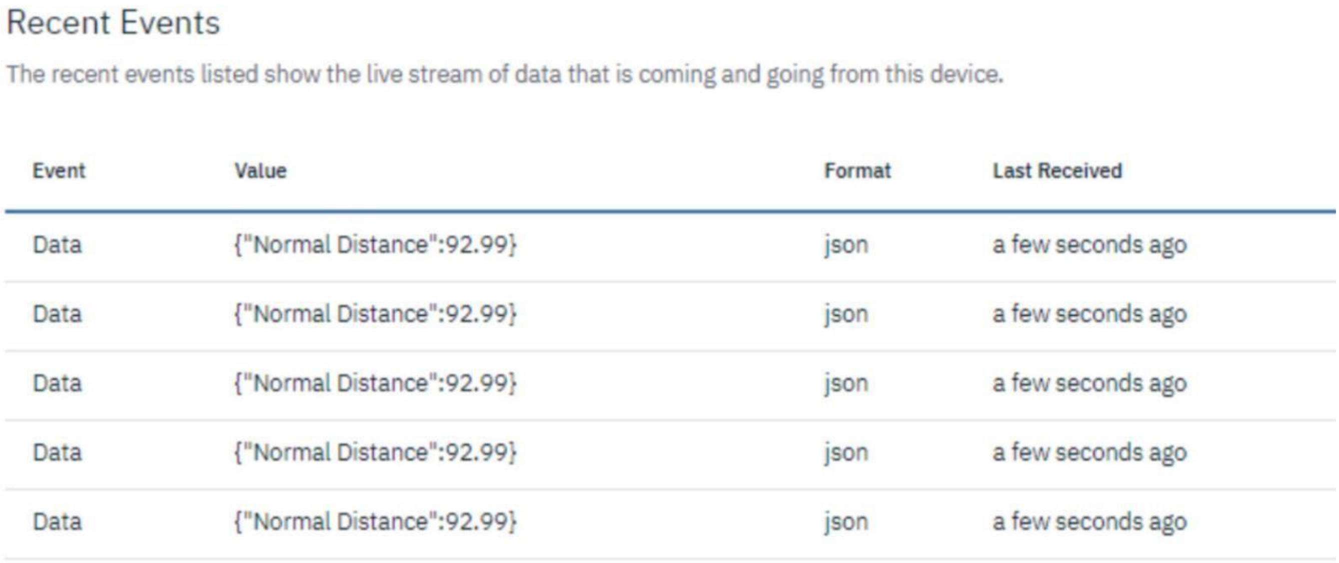


Recent Events

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"Alert distance":106.98}	json	a few seconds ago
Data	{"Alert distance":107.03}	json	a few seconds ago
Data	{"Alert distance":106.98}	json	a few seconds ago
Data	{"Alert distance":106.98}	json	a few seconds ago
Data	{"Alert distance":106.98}	json	a few seconds ago





Recent Events

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago