

Advantech AE Technical Share Document

Date	20231025	SR#	1-3460925552
Category	<input type="checkbox"/> FAQ <input checked="" type="checkbox"/> SOP	Related OS	N/A
Abstract	How to Send WISE-4000 IO Data to Azure IoT Hub via MQTT		
Keyword	WISE, Azure IoT Hub, cloud upload, push notification		
Related Product	WISE-40XX series		

■ **Problem Description:**

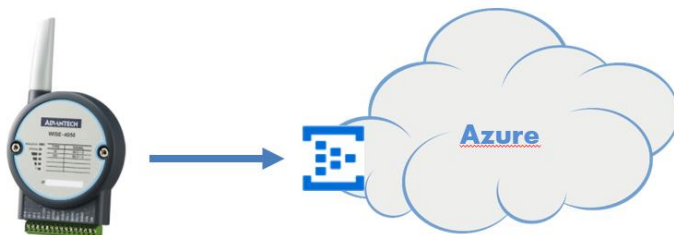
This document shows that how to connect with Azure IoT Hub and make sure push data successfully. Utilize Node-Red to **monitor the pushed data**.

■ **Brief Solution - Step by Step:**

Azure could be connected with end device through HTTP and MQTT protocol. WISE utilize HTTP protocol to connect with Azure IoT Hub. WISE does not need an extract gateway to connect with the service.

WISE pushes data to Azure event hub (figure 1 (A)) and upload .csv file to Azure Blob Storage account (figure 1 (B)). SOP video of both functions can be found in the same archive folder of this document. This document shows the details about pushing real-time data (figure 1 (C)).

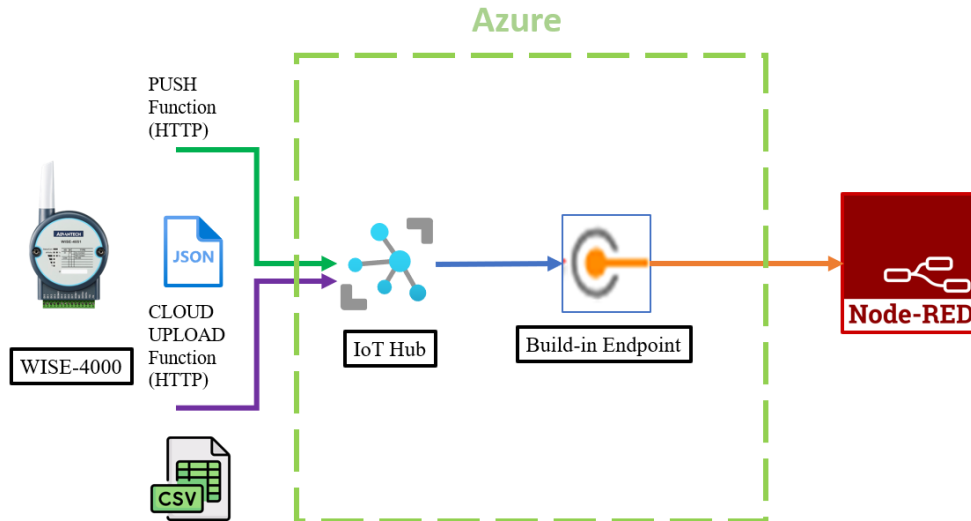
	Upload file	Push data
Data format	csv	JSON
Data type	A batch of historical record.	The last real-time data.
Support resume data after the connection is restored.	Yes.	No. Will discard the data after retry 3 times.
Link	https://youtu.be/xfI6bSPa8jA	https://youtu.be/scvNMPtwLuc



(A)



(B)



(C)

Figure 1. (A)(B) WISE FW **support cloud upload/push data** to Azure IoT Hub

(C) The topology of this documentation.

JSON messages does not storage in any file, it **only temporary storage in event hub for few hours**. Unless a user utilize these messages for another application, these messages will be deleted.

Step1. Refer to the website of Microsoft and create an account.

<https://docs.microsoft.com/en-us/azure/iot-hub/>

In the Azure portal, click New > Internet of Things > IoT Hub.

<https://portal.azure.com/?signIn=1#home>

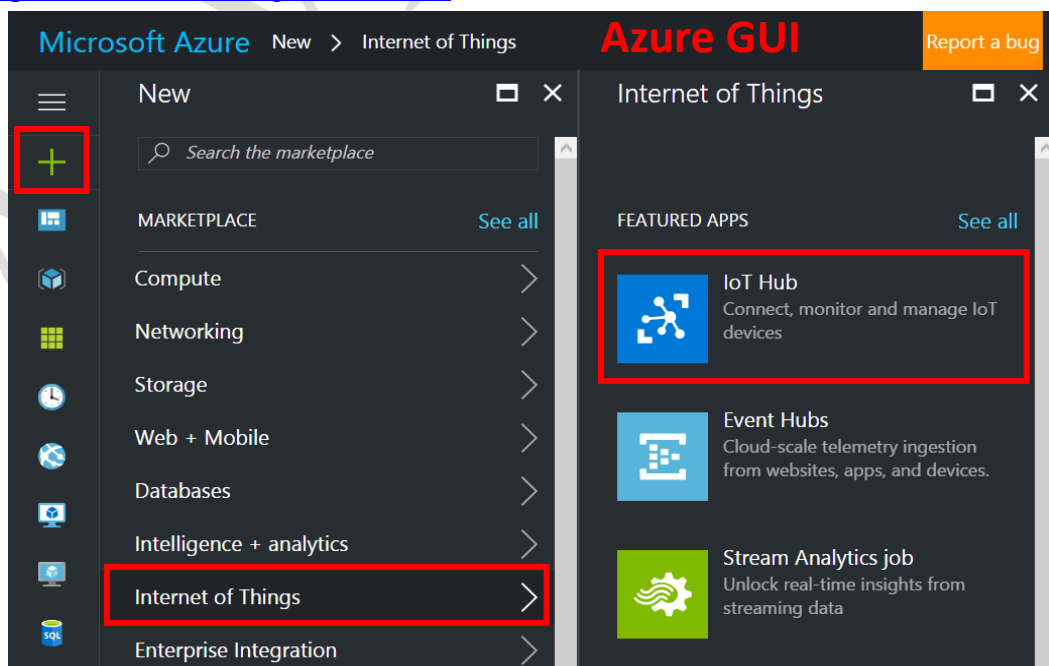


Figure 1. Create an account.

Step 2. Fill in the **connection information** in WISE-4000 GUI page.

WISE-4671-S617TUA

WISE-4000 GUI

Configuration

Information Cellular Positioning Network App Time & Date Control **Cloud** Firmware

Cloud Configuration

1 Select Service Azure MQTT

Setting

2 UUID WISE-4671-S617TUA_6159297

3 Connection String HostName=W... DIq7PfeKkPCrV

4 Port Number 8883

5 Heartbeat Frequency (sec) 60

6 Publish QoS 1 7 Subscribe QoS 1

8 Submit

1. Select "Azure MQTT" function in **CLOUD** configuration page.
2. UUID: which is set in **configuration/information** page. Cannot connect multiple devices with the same UUID.

WISE-4671-S617TUA

WISE-4000 GUI

Configuration

Information **Cellular** Positioning Network App Time & Date Control

Information

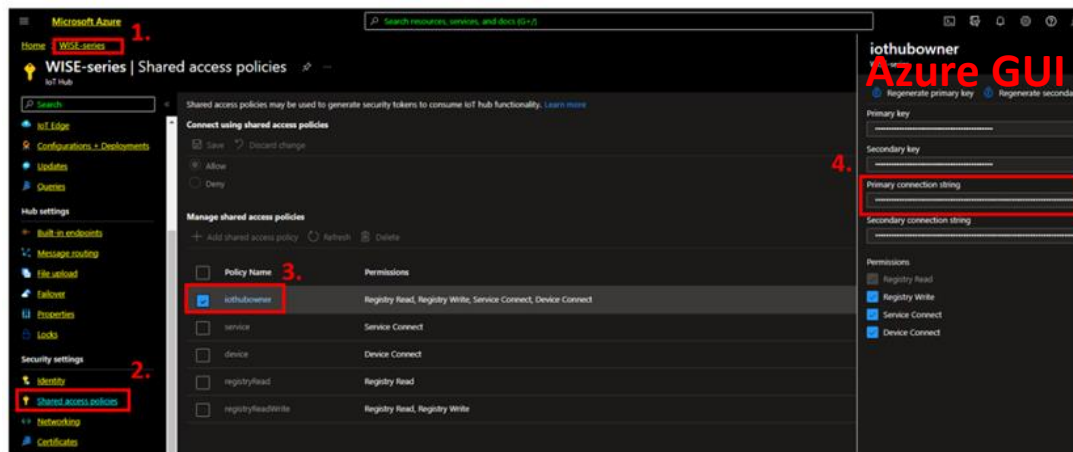
Module Information

Model Name WISE-4671-S617TUA

UUID WISE-4671-S617TUA_6159297

Description

3. Connection String: copy-paste from Azure GUI page -> **shared access policies/iothubowner/primary connection string**



4. Port: **8883** (TLS)
5. Heartbeat: **60** for example
6. Publish QoS: **less than 2**
7. Subscribe QoS: **less than 2**
8. **Submit** the modification

Step 3. Check the system clock in your WISE module. **The connection key is available within 365 days. If the WISE module timing is far different from the Azure server timing, the server will disconnect the client (WISE) automatically.** If a user is using WISE-4012E (figure 2), the system clock needs to be correctness after power-on every time due to there is no RTC hardware in this model.

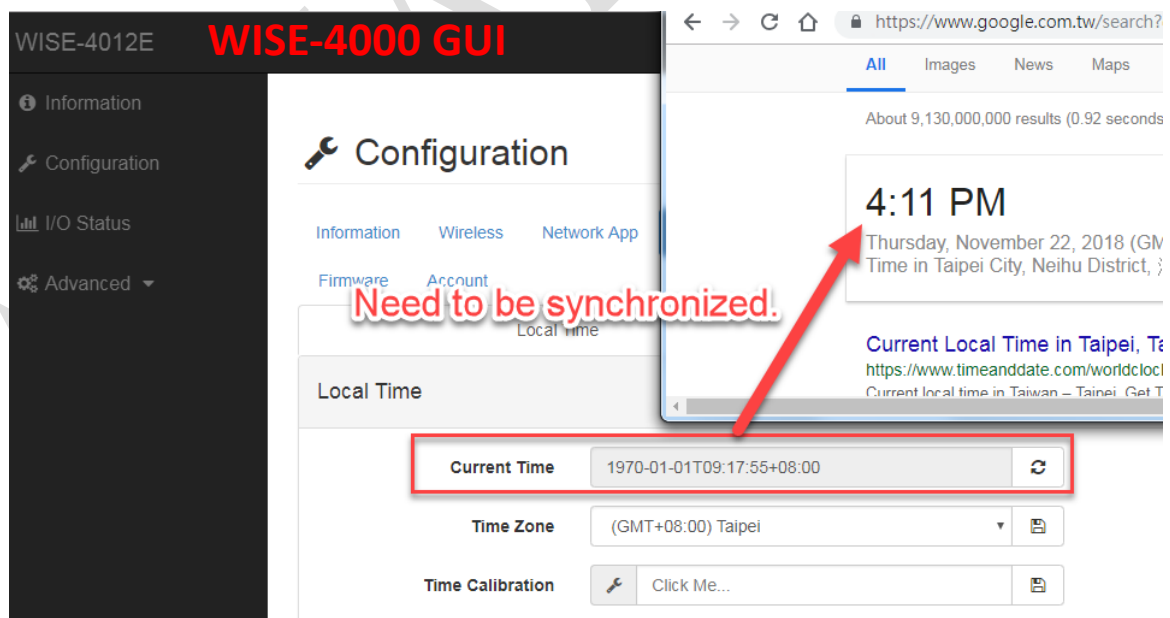


Figure 2. The system clock needs to be synchronized.

Step 4. **Enable push notification function** of WISE-4000 (figure 3).

Push Notification (JSON format)

WISE-4000 GUI

I/O Log ☒ ON

System Log ☐ OFF

☒ Push MAC Address

☒ Push Timestamp

Timestamp Format Local Date and Time(GMT)

Figure 3. Enable PUSH notification.

Step 5. Open **Device** panel in Azure GUI and **Add** a new device (figure 4 & figure 5). The **Device ID** should be the same as **UUID** in WISE web utility. **Authentication Type** please set as **Symmetric Key**, enables the **Auto Generate Keys**, and **Enable** the **Connect device to IoT Hub** setting.

Noted: The **UUID** is setup in **Configuration** page of WISE web utility (figure 6).

WISE-series | Devices

Azure GUI

View, create, delete, and update devices in your IoT Hub. [Learn more](#)

+ Add Device ^{2.} Refresh Assign tags Delete

enter device ID Types: All + Add filter

Device ID	Type	Status	Last status update	Authentication type	C2D messages queued
<input type="checkbox"/> WISE-4471-S251UA_1730208	IoT Device	Enabled	--	Secret Access Signature	0
<input type="checkbox"/> ECUhaleyTest	IoT Device	Enabled	--	Secret Access Signature	0
<input type="checkbox"/> WISE-4012_00D0C9FACB04	IoT Device	Enabled	--	Secret Access Signature	0
<input type="checkbox"/> WISE-4050_74FE486BFA55	IoT Device	Enabled	--	Secret Access Signature	0
<input type="checkbox"/> WISE-4671-S617TUA_6159297	IoT Device	Enabled	--	Secret Access Signature	0
<input type="checkbox"/> ECU1051_AEtest	IoT Device	Enabled	--	Secret Access Signature	0

Device management

1. Devices IoT Edge Configurations + Deployments Updates

Figure 4. Azure IoT Hub with **Device** panel.

Create a device

Device ID * ⓘ UUID

WISE-4012_00D0C9FAC804

☐ IoT Edge Device 3.

Authentication type ⓘ

Symmetric key X.509 Self-Signed X.509 CA Signed

Auto-generate keys ⓘ

☒

Connect this device to an IoT hub ⓘ

Enable Disable

Parent device ⓘ

No parent device

[Set a parent device](#)

Save 4.

Azure GUI

Figure 5. Device setting of adding a new device in Azure IoT Hub.

WISE-4000 GUI

Information

Module Information

Model Name WISE-4012

UUID WISE-4012_00D0C9FAC804

Description

Azure GUI

WISE-series | Devices

IoT Hub

Overview, create, delete, and update devices in your IoT Hub. Learn more

+ Add Device Refresh Assign tags Delete

enter device ID Types: All + Add filter

Device ID	Type
WISE-4471-S251UA_1730208	IoT Device
ECUhalleyTest	IoT Device
WISE-4012_00D0C9FAC804	IoT Device
WISE-4050_74FE486BFA55	IoT Device
WISE-4671-S617TUA_6159297	IoT Device
ECU1051_AEtest	IoT Device

WISE-4000 GUI

Module

Model Name WISE-4012

Customized Name WISE-4012

UUID WISE-4012_00D0C9FAC804

Location

Description

Figure 6. WISE web utility with the same **Device ID** as on Azure IoT Hub.

Step 6. Use Node-Red which helps monitoring the data that WISE uploaded/pushed. After Node-Red is executed, click **setting menu** from the **top-right corner** and choose **Manager palette** to find the plugin function.

Noted: Download and install **Node.js** & **Node-Red** from the official website:

[Node.js](https://nodejs.org/)

[Node-RED](https://nodered.org/)

Node-Red GUI

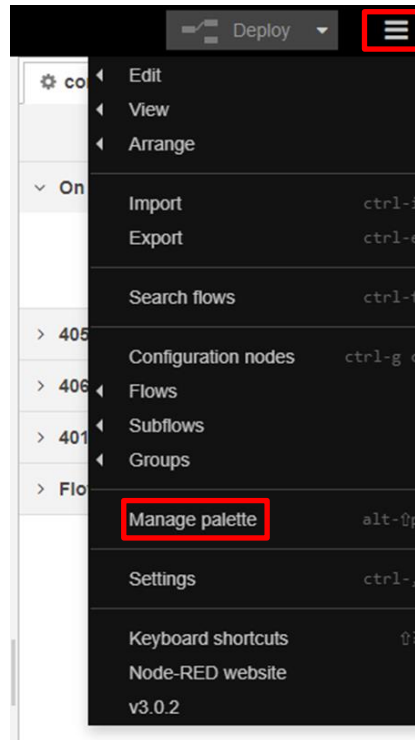


Figure 7. Install plug-in function of Node-Red to monitor WISE-4000's data from Azure Iot Hub.

Step 7. Click install tag and type “**azure-iot-hub**” to find and install “**node-red-contrib-azure-iot-hub**” which is the plug-in function monitoring data from **Azure** (figure 8).

Noted: The introduction guide of the function, please see the link bellowed.

[node-red-contrib-azure-iot-hub \(node\) - Node-RED](#)

Node-Red GUI

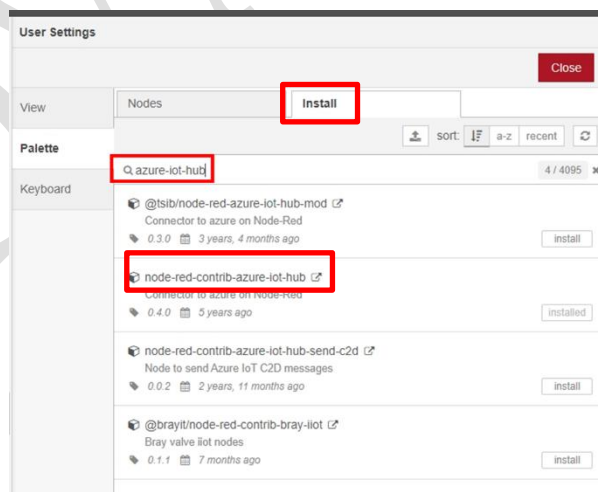


Figure 8. Install plug-in function for monitoring data from Azure Iot Hub.

Step 8. Shown as figure 9, After the function is installed, you can **drag the nodes** from the **nodes bar** at the left side of the website.

Node-Red GUI



Figure 9. Nodes of Node-Red monitoring data from WISE-4000 through Azure IoT Hub

Step 9. Drag a “**Azure IoT Hub Receiver**” node to receive the data from Azure IoT Hub. Drag and connect a debug node with “**Azure IoT Hub receiver**” node as Figure 10 shown.

Node-Red GUI

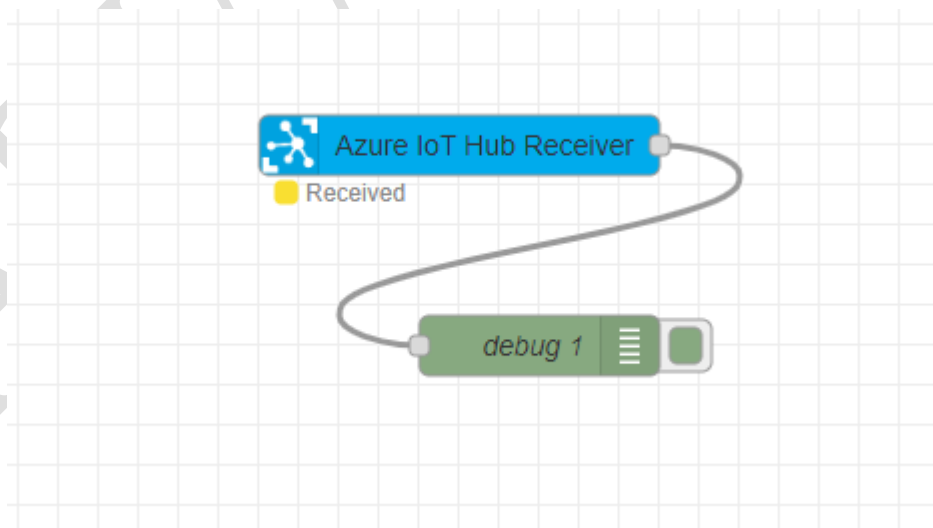


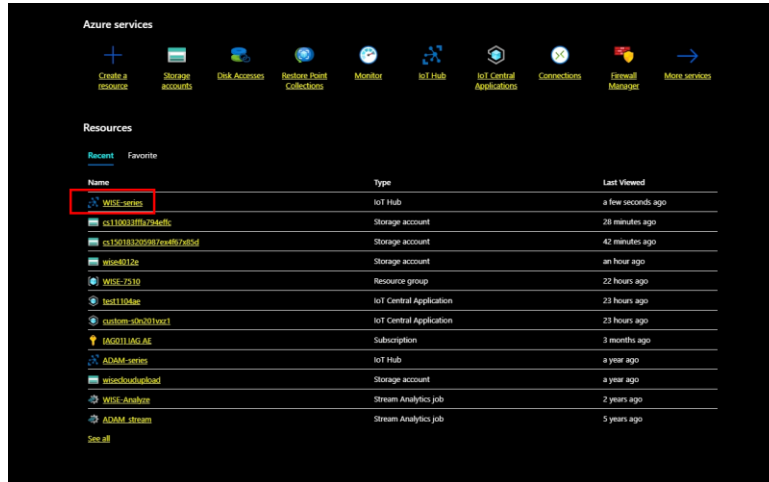
Figure 10. Connect **Azure IoT Hub Receiver node** with a “**debug**” node.

Step 10. Double click “**Azure IoT Hub Receiver**” node and enter the **ConnectionString** for your **Azure IoT Hub Receiver** and click Done.

Noted: Following steps to get **ConnectionString** for your Azure IoT Hub.

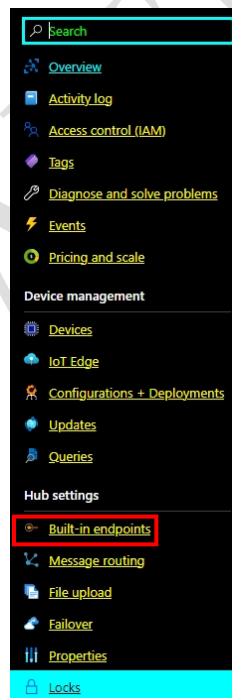
A. Go to Azure website and **click** IoT-Hub.

Azure GUI



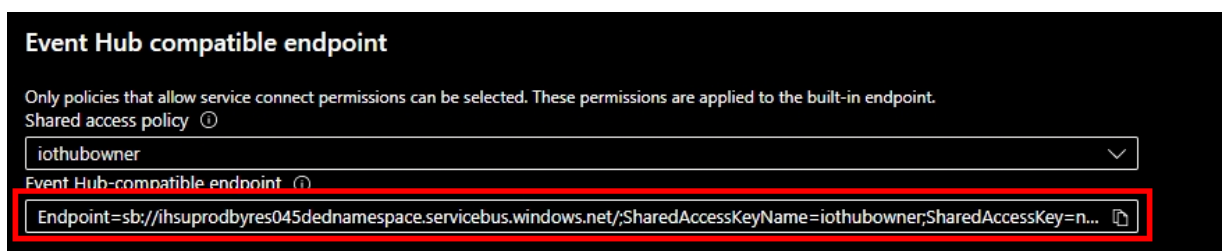
B. Hub setting → Built-in endpoint

Azure GUI



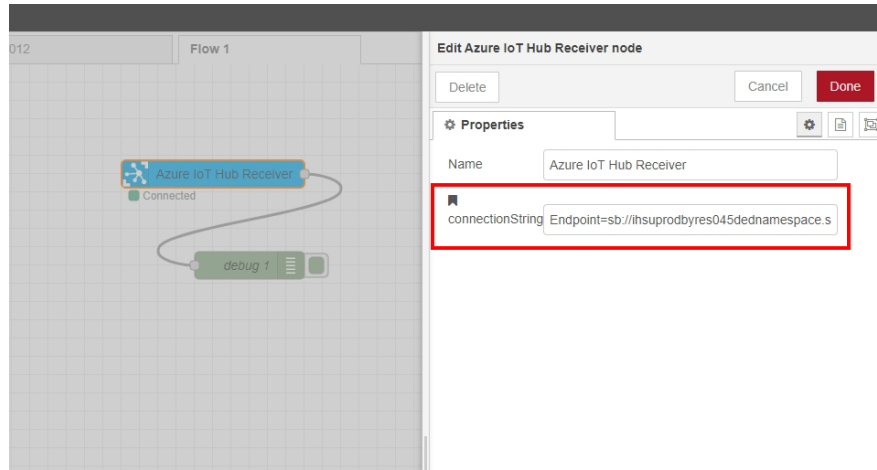
C. Copy the text from **Event Hub-compatible endpoint**.

Azure GUI



D. Paste the text to **Azure IoT Hub-Receiver** node

Node-Red GUI



Results. Monitor the data which is pushed by WISE to Azure IoT Hub (figure 11). Click the bug icon then Node-Red will show the logs from WISE.

Node-Red GUI

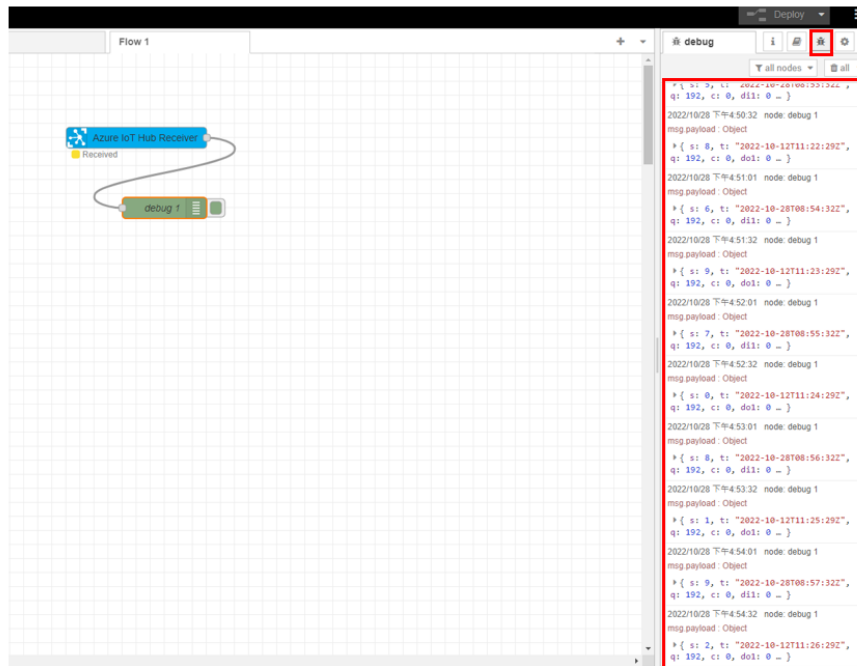


Figure 11. Node-Red monitoring pushed data from WISE.