

A man in a light blue shirt is shown from the side, holding a tablet computer. He is looking at the screen, which displays a dashboard with various charts and data. The background is a blurred industrial factory setting with white machinery and equipment.

SIEMENS

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SIMATIC IOT2000 Connection to IBM Watson IoT Platform

SIMATIC IOT2040

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1 Task

1.1 Overview

Introduction

This application example shows how to send data from the SIMATIC IOT2000 to the IBM Watson IoT Platform via node-red. The SIMATIC IOT2000 will also act as OPC UA Client to collect data from an OPC UA Server.

Goals

After working through this document you will know how to

- Use the node-red OPC UA Client
- Send data to the IBM Watson IoT Platform

NOTICE	Precondition! To use this sample it is required that the Initial Operation in the Document “Setting up the SIMATIC IOT2000” has been executed once.
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2 Application Example

This application contains a node-red OPC UA Client subscribing two values of the OPC UA Server of the SIMATIC S7-1500 Software Controller and sending this data to the IBM Watson IoT Platform.

2.1 Preconditions

Table 2-1

No.	Action
1.	Know how to use the OPC UA node and the web interface of node-red. Please have a look to the Application Example " OPC UA Client with node-red "
2.	Having an account at IBM Bluemix. A free test account is enough for this example. More information can be found here .
3.	Create a Service "Internet of Things" within IBM Bluemix
4.	Register your SIMATIC IOT2000 as a Gateway in IBM Watson IoT Platform How to: https://developer.ibm.com/recipes/tutorials/how-to-register-gateways-in-ibm-watson-iot-platform/
5.	Note down this information of the registered Gateway <ul style="list-style-type: none"> • Organization ID • Device Type • Device ID • Authentication Token

2.2 Install node-red IBM Watson IoT node

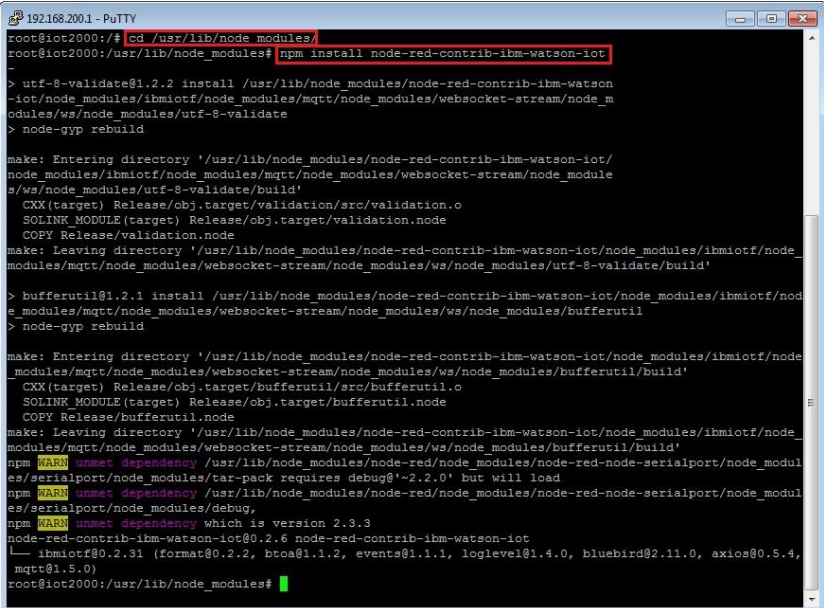
From version V2.1.2 of the example image the program node-red is preinstalled. The additional node for IBM Watson IoT connection has to be installed by the user.

NOTE For installing this node-red node an internet connection is required!

The following table shows how to install the additional node.

Table 2-2

No.	Action
1.	Open a valid Putty Connection to your IOT2000
2.	Type in cd /usr/lib/node_modules to go to the node-red directory

No.	Action
3.	<p>Type in npm install node-red-contrib-ibm-watson-iot to install the node</p>  <pre> 192.168.200.1 - PuTTY root@iot2000:/# cd /usr/lib/node_modules/ root@iot2000:/usr/lib/node_modules# npm install node-red-contrib-ibm-watson-iot > utf-8-validate@1.2.2 install /usr/lib/node_modules/node-red-contrib-ibm-watson-iot/node_modules/ibmiotf/node_modules/mqtt/node_modules/websocket-stream/node_modules/ws/node_modules/utf-8-validate > node-gyp rebuild make: Entering directory '/usr/lib/node_modules/node-red-contrib-ibm-watson-iot/node_modules/ibmiotf/node_modules/mqtt/node_modules/websocket-stream/node_modules/ws/node_modules/utf-8-validate/build' CXX(target) Release/obj.target/validation/src/validation.o SOLINK_MODULE(target) Release/obj.target/validation.node COPY Release/validation.node make: Leaving directory '/usr/lib/node_modules/node-red-contrib-ibm-watson-iot/node_modules/ibmiotf/node_modules/mqtt/node_modules/websocket-stream/node_modules/ws/node_modules/utf-8-validate/build' > bufferutil@1.2.1 install /usr/lib/node_modules/node-red-contrib-ibm-watson-iot/node_modules/ibmiotf/node_modules/mqtt/node_modules/websocket-stream/node_modules/ws/node_modules/bufferutil > node-gyp rebuild make: Entering directory '/usr/lib/node_modules/node-red-contrib-ibm-watson-iot/node_modules/ibmiotf/node_modules/mqtt/node_modules/websocket-stream/node_modules/ws/node_modules/bufferutil/build' CXX(target) Release/obj.target/bufferutil/src/bufferutil.o SOLINK_MODULE(target) Release/obj.target/bufferutil.node COPY Release/bufferutil.node make: Leaving directory '/usr/lib/node_modules/node-red-contrib-ibm-watson-iot/node_modules/ibmiotf/node_modules/mqtt/node_modules/websocket-stream/node_modules/ws/node_modules/bufferutil/build' npm WARN unmet dependency /usr/lib/node_modules/node-red/node_modules/node-red-node-serialport/node_modules/serialport/node_modules/tar-pack requires debug@'-2.2.0' but will load npm WARN unmet dependency /usr/lib/node_modules/node-red/node_modules/node-red-node-serialport/node_modules/serialport/node_modules/debug, npm WARN unmet dependency which is version 2.3.3 node-red-contrib-ibm-watson-iot@0.2.6 node-red-contrib-ibm-watson-iot └─ ibmiotf@0.2.31 (format@0.2.2, btcoa@1.1.2, events@1.1.1, loglevel@1.4.0, bluebird@2.11.0, axios@0.5.4, mqtt@1.5.0) root@iot2000:/usr/lib/node_modules# </pre>

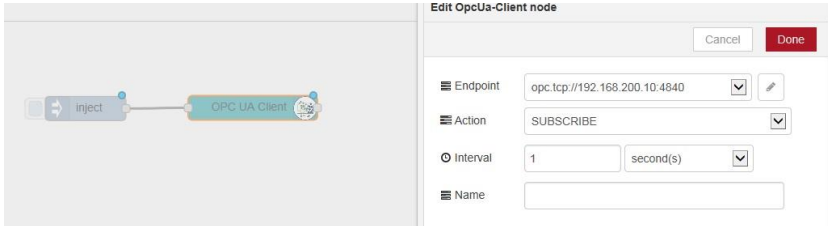

2.3 Configure the node-red program

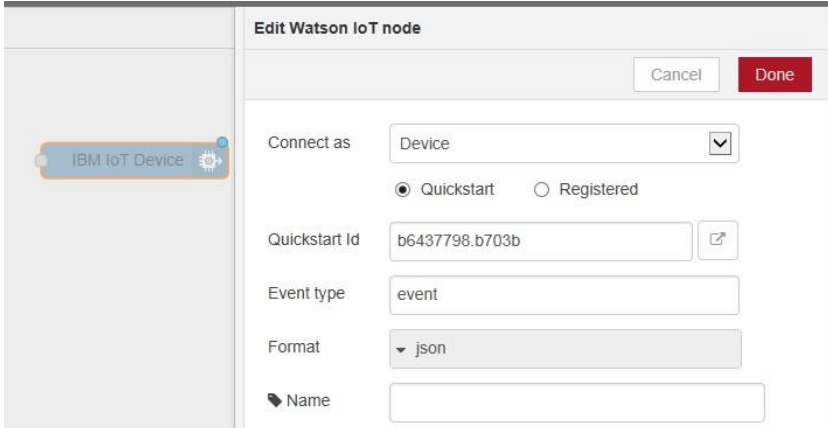
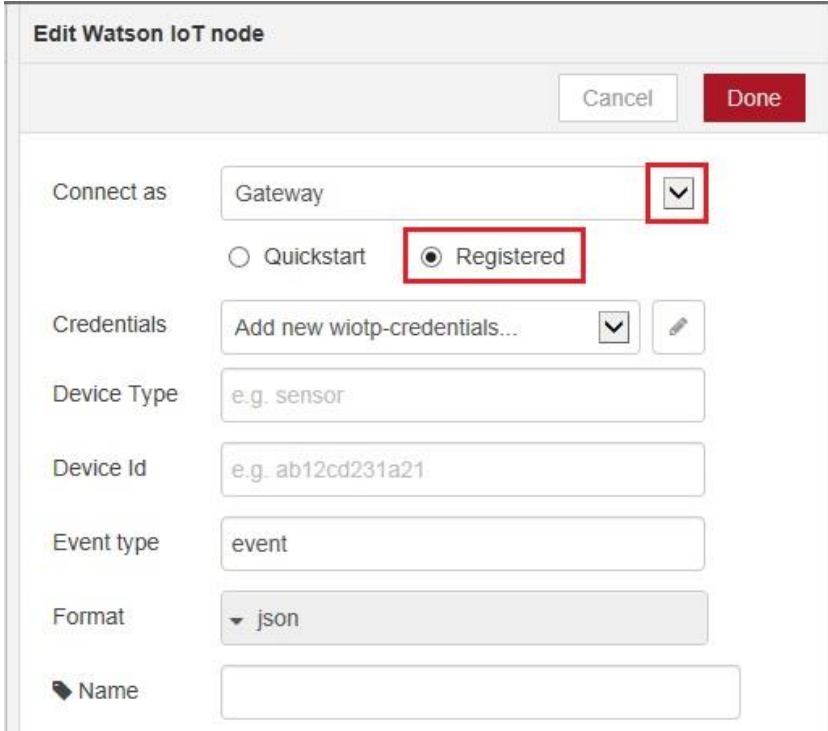
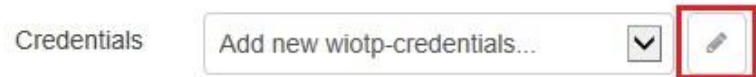
NOTE To establish a connection to the Watson IoT Platform the SIMATIC IOT2000 requires an internet connection!

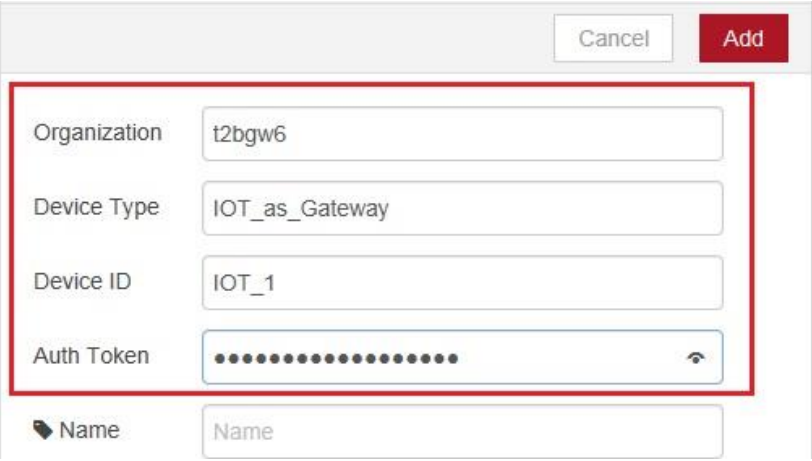
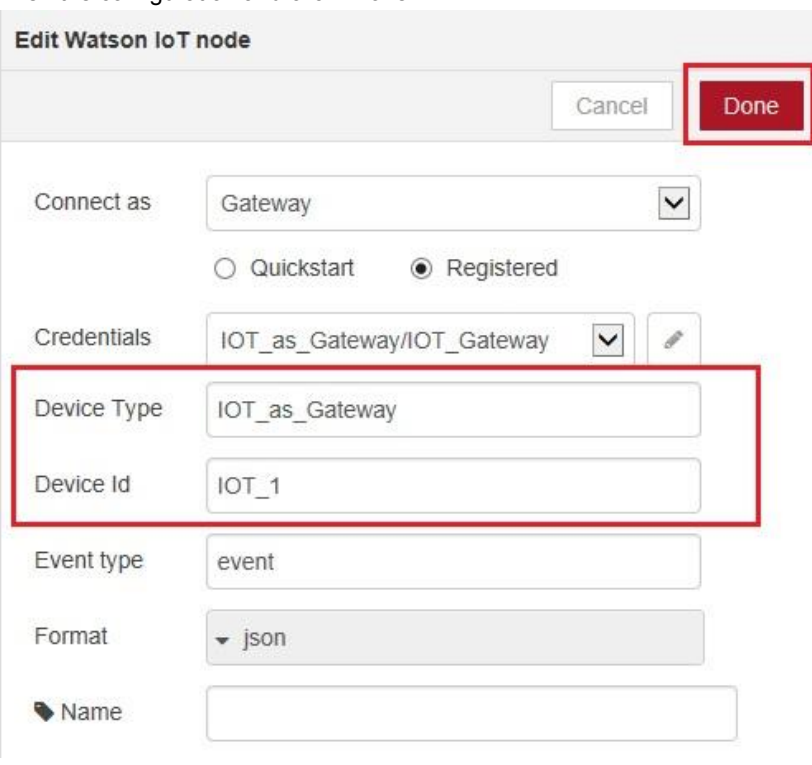
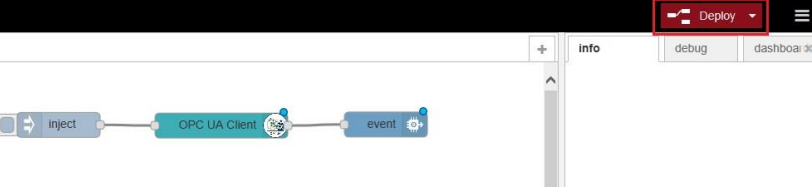
2.3.1 Example with existing Bluemix Account


The following table shows how to create your node-red program.

Table 2-2

No.	Action
1.	<p>Configure the OPC UA Client node like described in this application example. In this application example a temperature value is subscribed from the S7-1500 CPU</p> 
2.	<p>Choose the “Watson IoT” output node and add it per Drag&Drop to the middle</p> 

No.	Action
3.	<p>Double-click on the node</p> 
4.	<p>Choose "Gateway" as connection and select "Registered"</p> 
5.	<p>Add your Watson IoT Platform Credentials</p> 

No.	Action
6.	<p>Fill in your credentials like you noted down during registration of a new gateway</p> 
7.	<p>Finish the configuration and click "Done"</p> 
8.	<p>Wire the nodes and click on "Deploy" to download the program to the SIMATIC IOT2000</p> 

No.	Action
9.	<p>Now the SIMATIC IOT2000 sends data to the added Gateway in your Bluemix Account</p> 

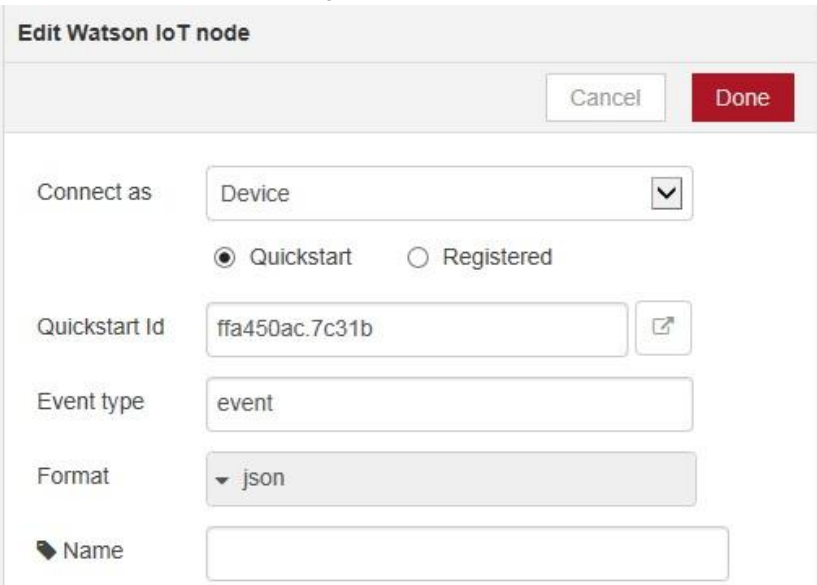
2.3.2 Quickstart solution

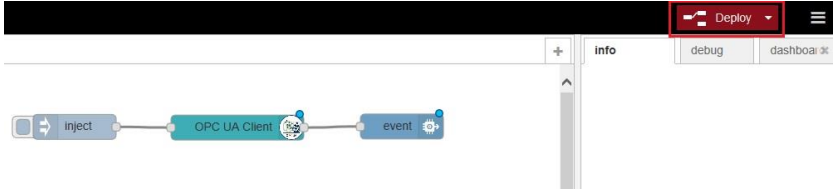
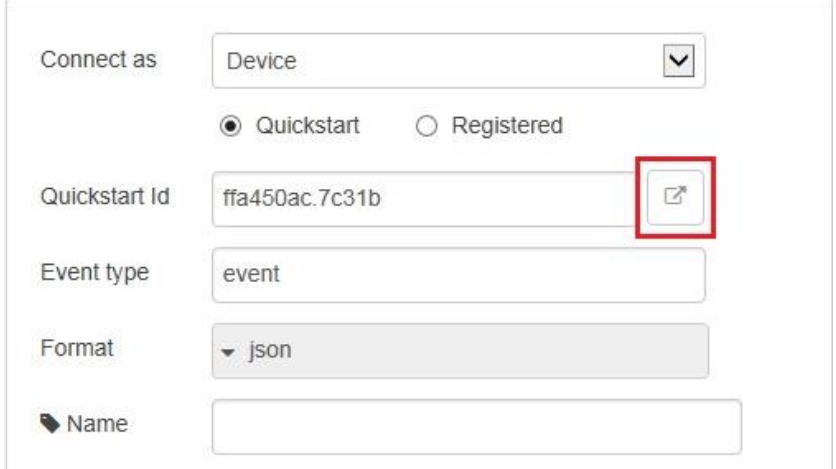
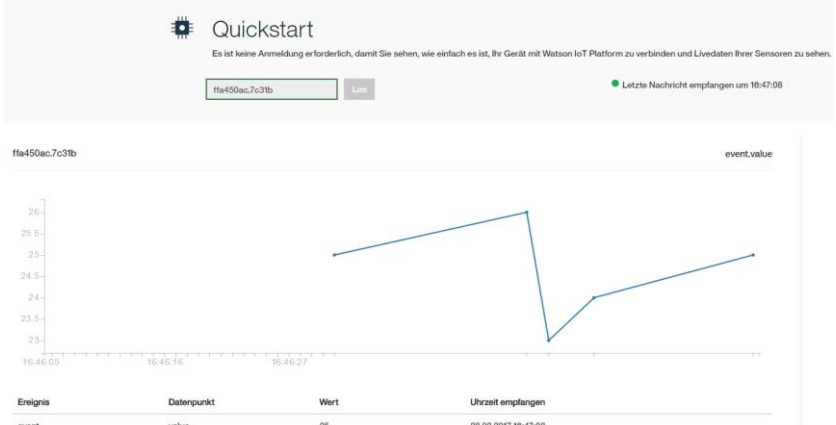
If you don't have a Bluemix account or don't want to create one, you can use the so-called Quickstart option of the Watson IoT node.

By using the Quickstart service, the connection will use a randomly generated Device ID, which can be configured in the node. The value can be shown only on the Quickstart dashboard.

The following table shows how to configure the Quickstart solution

Table 2-3

No.	Action
1.	Choose the "Watson IoT" output node and add it via Drag&Drop to the middle
2.	<p>You can keep the default settings of the node</p> 

No.	Action
3.	<p>Wire the nodes and click on “Deploy” to download the program to the SIMATIC IOT2000</p> 
4.	<p>To open the Quickstart dashboard double-click on the Watson IoT node and follow the link to the dashboard</p> 
5.	<p>Your default browser will open and display the dashboard</p> 

3 Checklist

This chapter contains a Checklist which summarizes all important steps in this application example.

Table 3-1

No.	Action
1.	Make sure preconditions are given
2.	Install Watson IoT node
3.	Configure node-red program

4 Related links

Table 4-1

	Topic
\1\	SIMATIC IOT2000 forum www.siemens.com/iot2000-forum
\2\	SIMATIC IOT2000 Setting Up https://support.industry.siemens.com/tf/ww/en/posts/155642/
\3\	SIMATIC IOT2000 Getting Started https://support.industry.siemens.com/tf/ww/en/posts/155643/
\4\	OPC UA Client with node-red https://support.industry.siemens.com/tf/ww/en/posts/opc-ua-client-with-node-red/159059/?page=0&pageSize=10
\5\	IBM Bluemix documentation https://console.eu-gb.bluemix.net/docs/?locale=en

5 History

Table 5-1

Version	Date	Modifications
V1.0	02/2017	First version