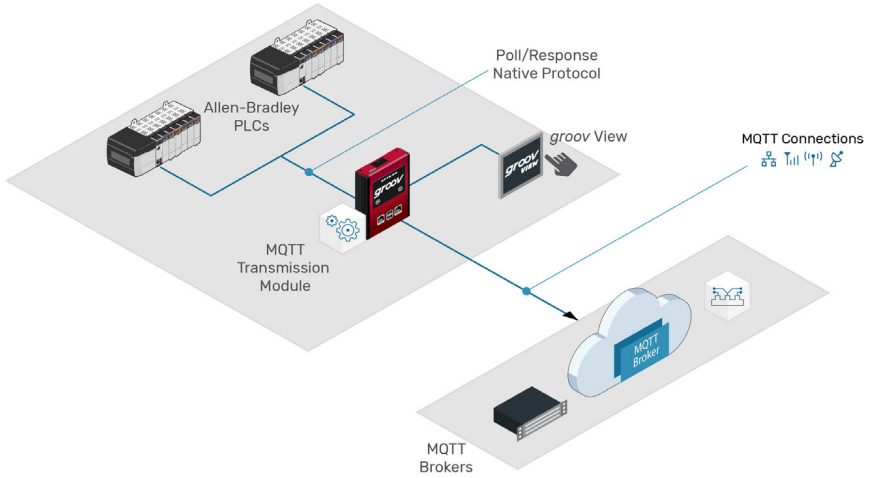
This technical note shows you how to publish tag data from your Allen-Bradley® PLCs using the Ignition® Edge MQTT Transmission module in a *groov* Edge Appliance (*groov* Box). For *groov* EPIC or *groov* RIO, see form 2350, *Getting Started with MQTT in groov Products*. Or check out our how-to videos for *groov* Box or for *groov* EPIC.



What you need

- The IP address or domain name of a computer running an *MQTT broker*. An MQTT broker (also known as an *MQTT server*) is software that receives MQTT messages and sends them to systems that have subscribed to the messages. If you don't have an MQTT broker, ask your IT department to help you get one. For testing purposes, you can find free public MQTT brokers on the internet.
- A GROOV-AR1 Box with *groov* Admin v1.570.47 or higher, already configured with Ignition Edge and its internal OPC-UA server.

  For help setting up Ignition Edge in your groov Box, see our Ignition Workshop videos or the groov Box User's Guide (form 2104).

- Any of the following Allen-Bradley PLCs, accessible to the *groov* Box via Ethernet:
  - Logix: ControlLogix® and CompactLogix® with firmware v21 and higher
  - ControlLogix with firmware v20 and lower
  - CompactLogix with firmware v20 and lower
  - SLC™ 5/05
  - PLC-5®
  - MicroLogix™ 1100, 1200, 1400, 1500

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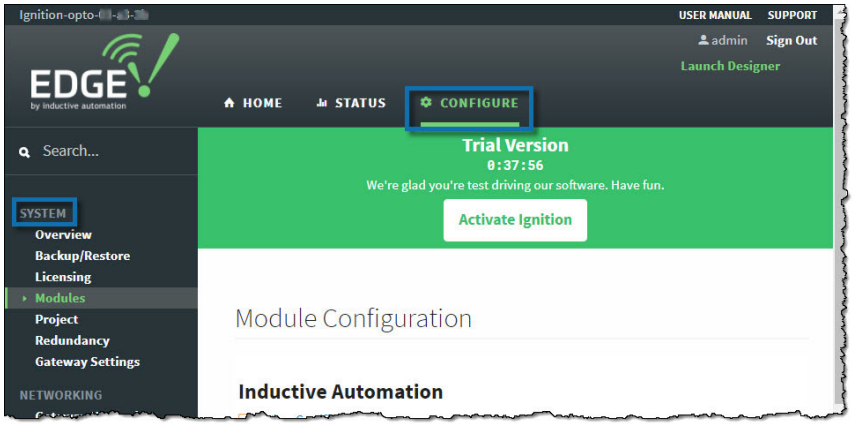
Step 1. Install and configure the MQTT Transmission module

In this step, you use Ignition Edge in the groov Box to install and configure the MQTT Transmission module. The module sends messages to the MQTT broker when tag values change.

1. In a browser window, open Ignition Edge on your groov Box (port 8043).

   Example: `https://opto-99-xx-99:8043`

2. Sign in to Ignition Edge. If you haven't already done so, we strongly recommend you change the default username (`admin`) and password (`password`).
3. Click Configure, and then select System > Modules.



4. Scroll to the bottom to find MQTT Transmission, and then click its install button.

   Note: If you see a restart button instead of the install button, it means MQTT Transmission has already been installed. Continue to step 2.

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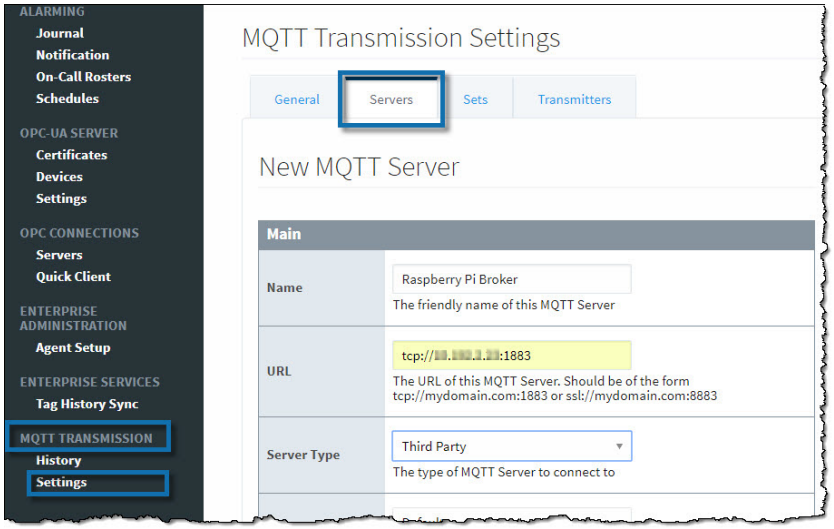
5. Click Confirm. Next, select the license terms check box, and then click Accept License.
6. Scroll to the bottom of Ignition Edge's left navigation bar, and select MQTT Transmission > Settings.
7. Click the Servers tab, and then click Create New MQTT Server.
8. On the New MQTT Server page:
   a. In the Name field, enter a name for the MQTT server hosting your MQTT broker.
   b. In the URL field, type the MQTT server's URL or domain name.
      Examples:
      `tcp://10.20.30.40:1883`
      `ssl://MyPiBroker.com:8883`
   c. In the Server Type field, select a type. If you're not sure, select Third Party.



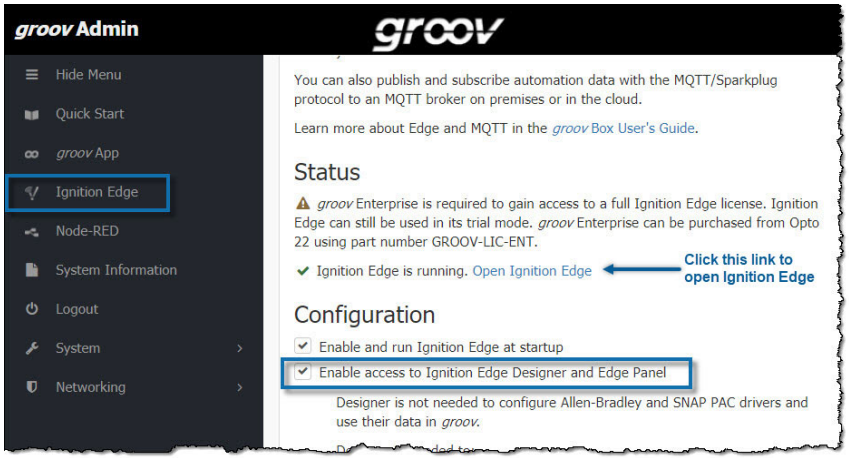
   d. If the server requires authentication, type the username in the Username field, and the password in both of the Password fields.
   e. If the server requires a security certificate, select and install it in the Certificates field.
9. Click Create New MQTT Server.

Step 2. Enable Ignition Edge Designer in the *groov* Box

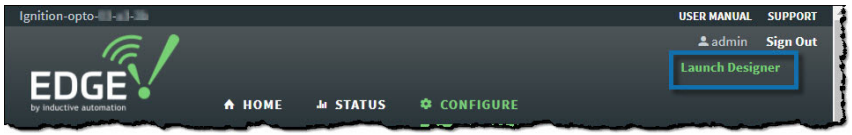
The MQTT Transmission module looks for tag data in a predefined folder structure. You create the folders in Ignition Edge Designer—but first, you need to enable Designer in the groov Box.

IMPORTANT: By enabling Designer, you are opening an unsecure TCP port on the groov Box. When you've finished using Designer, you should use groov Admin to **disable access** *to Designer (which closes the port).*

1. In a browser window, open *groov* Admin (port 10000 on the *groov* Box). Example:
   `https://opto-99-xx-99:10000`
2. In the left navigation bar, click Ignition Edge, and then select "Enable access to Ignition Edge Designer and Edge Panel."



3. Click Save.
4. When prompted, click the Back button, and then click the link to open Ignition Edge.
5. In Ignition Edge, click Launch Designer.



Clicking "Launch Designer" downloads *designer.jnlp*, a small file that starts Designer.

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If prompted, download and install Java, and then click Launch Designer.

To launch Designer:

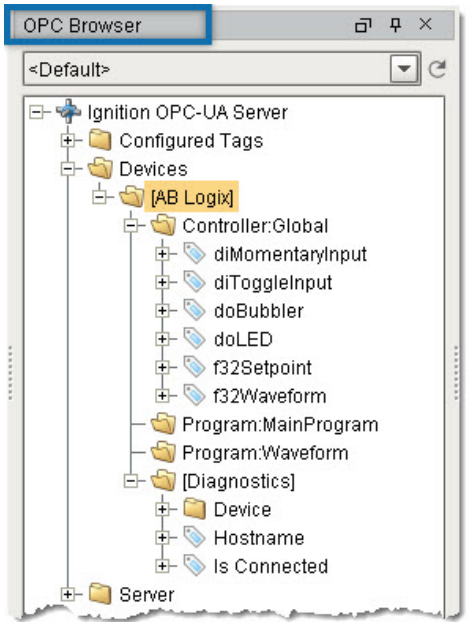
a. Click (or double-click) designer.jnlp, and then click through the security dialog boxes to get to the login page.

b. On the login page, enter your username and password, and then click Login.

6. Open the OPC Browser (View > Panels > OPC Browser), and expand the Devices folder.

Note the name of the folder containing the tags you want to publish; in this example, we want tags in the AB Logix folder.

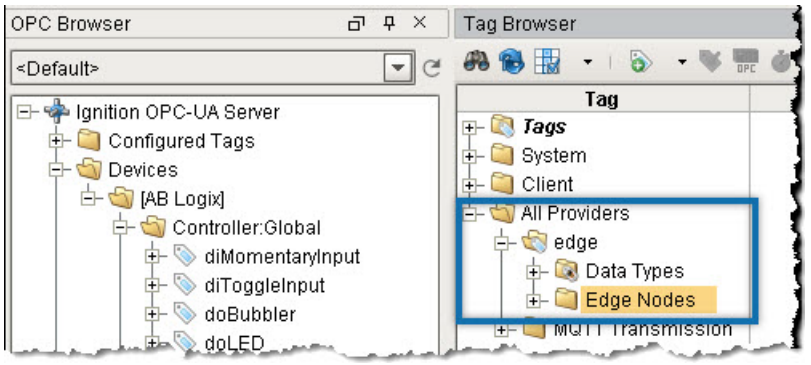
NOTE: If you can't see your PLCs in OPC Browser, it's possible they or the OPC-UA server (or both) haven't been configured in your groov Box. For instructions, see our Ignition Workshop videos or the groov Box User's Guide (form 2104).



Step 3. Create folders for MQTT Transmission

The required tag folder structure consists of three nested folders: Group ID, Edge Node ID, and Device ID. You create the folders in Designer's Tag Browser pane.

1. Open the Tag Browser (View > Panels > Tag Browser), and expand the All Providers folder until you see the Edge Nodes folder (All Providers > edge > Edge Nodes). You can reposition the panes; in this image, we've docked them side-by-side.

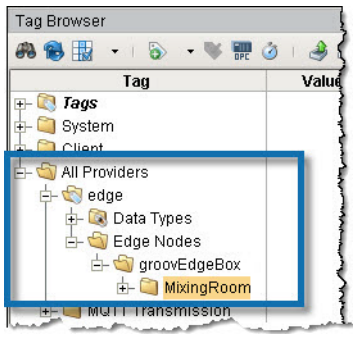


2. Right-click the Edge Nodes folder, and then select New Folder from the pop-up menu. This will be the Group ID folder. You can name this folder anything you like, but it's typically named for the device or vendor.

Type a name for the Group ID (for example, *groovEdgeBox*).

3. Right-click the Group ID folder. In the pop-up menu, select New Folder. This will be the Edge Node ID folder. You can name it anything you like, but typically it's named for the device's location.

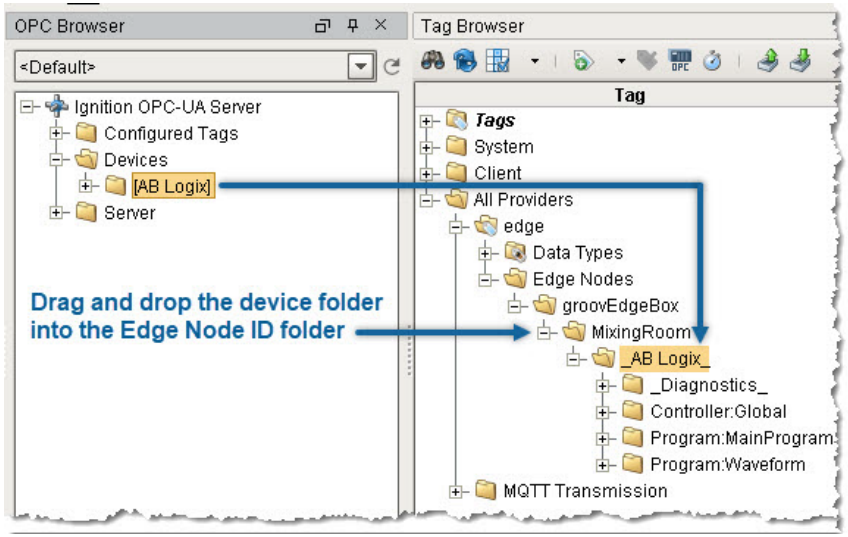
Type a name for the Edge Node ID (for example, *MixingRoom*).



4. Choose between two options to create the last folder (the Device ID folder, which will contain the tags to publish). For best performance, use Option 2.

   Option 1: If the tag folder in OPC Browser has 500 tags or less, you can drag and drop the tag folder into the Edge Node ID folder in Tag Browser.

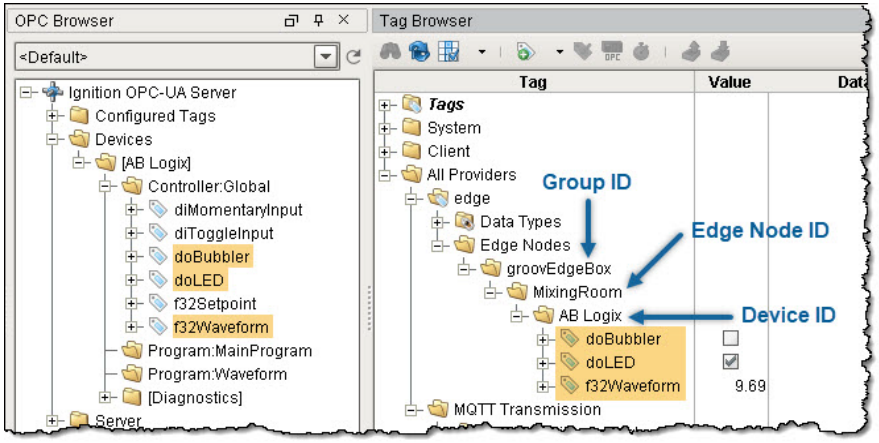
   Designer creates the Device ID folder (adding underscores to its name), and displays all the device's folders and tags in Tag Browser.



   Option 2: For best performance—or if the OPC Browser folder has more than Ignition Edge's limit of 500 tags—you can select the specific tags to publish.

   a. In Tag Browser, right-click the Edge Node ID folder. In the pop-up menu, select New Folder. This will be the Device ID folder. You can name it anything you like, but we recommend you give it the same name as the tag folder in OPC Browser.
   b. In OPC Browser, click the tags you want, and then drag and drop them into the Device ID folder.

   Tip: To select multiple tags at one time, hold down the Ctrl key while clicking the tags.

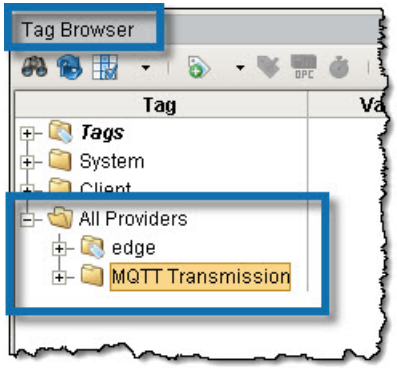


Step 4. Start publishing tag data to the broker

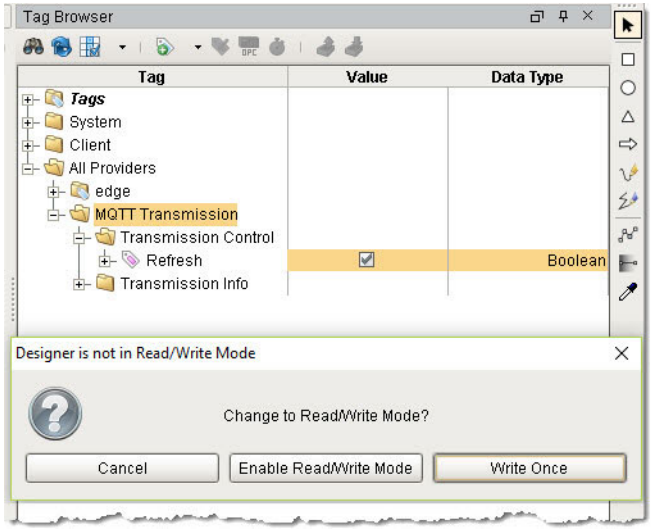
You need to enable read/write mode to start publishing tag data to the MQTT broker.

NOTE: If the folder or tag structure changes (for example, if you add new devices or change tagnames), you will need to repeat this step.

1. In Tag Browser's All Providers folder, collapse folders (or scroll down) until you see the MQTT Transmission folder.



2. Expand the MQTT Transmission folder, and then expand the Transmission Control folder. Then, select the Refresh check box. A prompt is displayed.



3. Click Write Once (or click Enable Read/Write Mode to prevent this prompt from appearing again).

   The Refresh check box is cleared. That's normal.

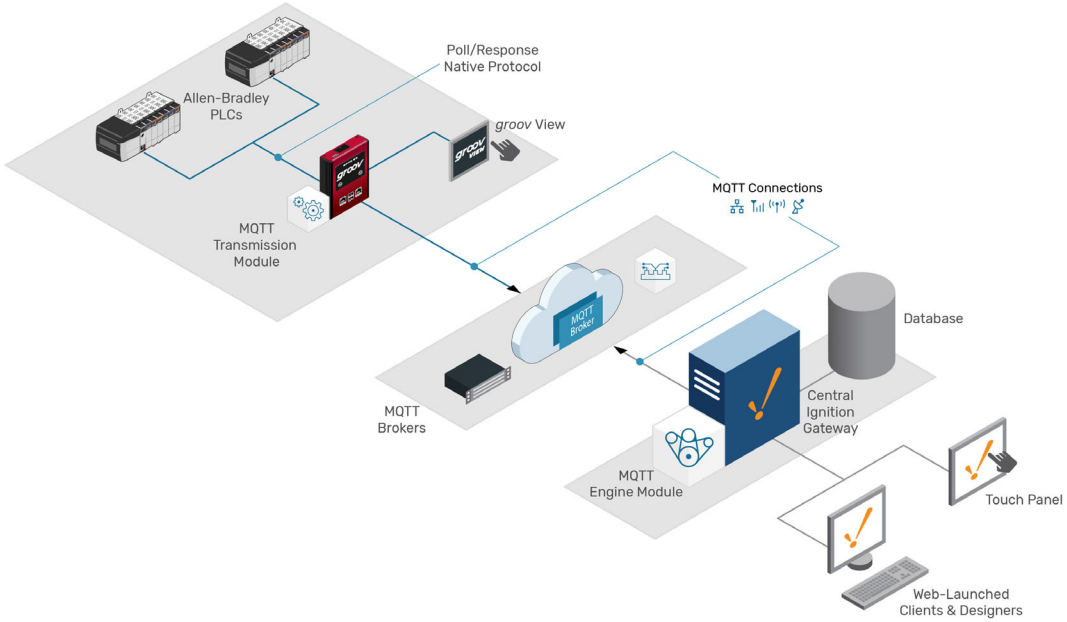
NOTE: When you've finished using Designer, you should use groov Admin to disable access to Designer (which closes the unsecure TCP port on the groov Box.).

Step 5. Test the subscription

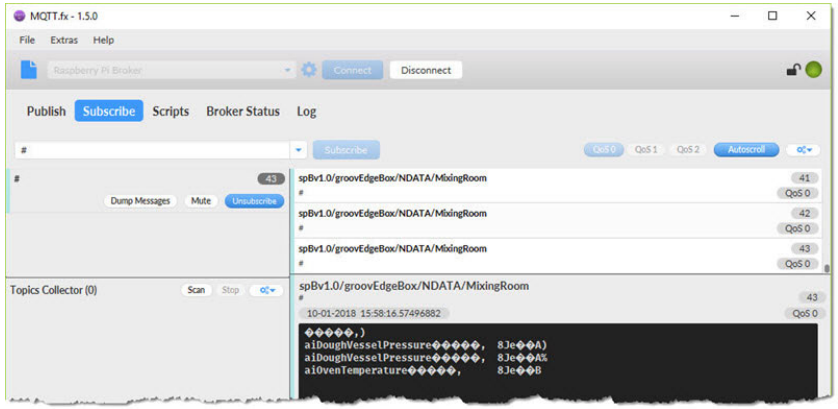
If you aren't getting data and you're running the trial version of Ignition Edge, make sure that the trial hasn't expired. (If it has, open Ignition Edge in the groov Box and click the Reset Trial button.)

There are several ways to test that the tags you're publishing are being sent to subscribers.

One way is to **use the desktop version of Ignition** (available to download free from the Inductive Automation website) to view tag values. The setup is quite a bit different from using Ignition Edge in the *groov* Box: among other things, you'll need to download and install the **MQTT Engine** module and configure it to subscribe to your broker. This method works best if you are already familiar with Ignition; if you aren't, the Cirrus Link website provides instructions for installing and configuring the MQTT Engine module.



Another way to test is to use a **desktop MQTT client** and debugger (such as MQTTfx). An MQTT client can verify whether data is being published—but it's not very helpful for getting real values, since MQTT clients display values in *binary* format.



For more tips, help, and code samples, visit the Opto 22 Developer Portal at http://developer.opto22.com.

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