SYMPHONY LINK DEVELOPMENT KIT

Table of Contents

Symphony Link Development Kit

Components

The Symphony Link Development Kit provides all the hardware to setup and experiment with a Symphony Link network.

The development kit includes...

A gateway

A Wifi-enabled Symphony Link Gateway (model LL-BST-8-915-SYM-W-I-US), including peripheral components to operate the gateway:

- 915-MHz antenna (Linx Technologies ANT-916-CW-HWR-SMA)
- Wifi antenna (PC Engines antsma)
- Wall-plug adapter (PC Engines ac12vus)
- 7-foot span of Ethernet cable

USB-UART evaluation boards

One LL-RLP-20 evaluation board and one LL-RXR-27 evaluation board. Also included:

- mini-USB cable to connect each evaluation board to a PC
- 915-MHz antenna (Linx Technologies ANT-916-CW-HWR-SMA) for each

A network tester

The network tester is a device to test the coverage of a Symphony Link network. The network tester automatically relays GPS position and on-board sensor data (temperature, pressure, humidity) to a Symphony Link network using an LL-RXR-27 module. Also included:

- 3 AA batteries
- 915-MHz antenna (Linx Technologies ANT-916-CW-HWR-SMA)

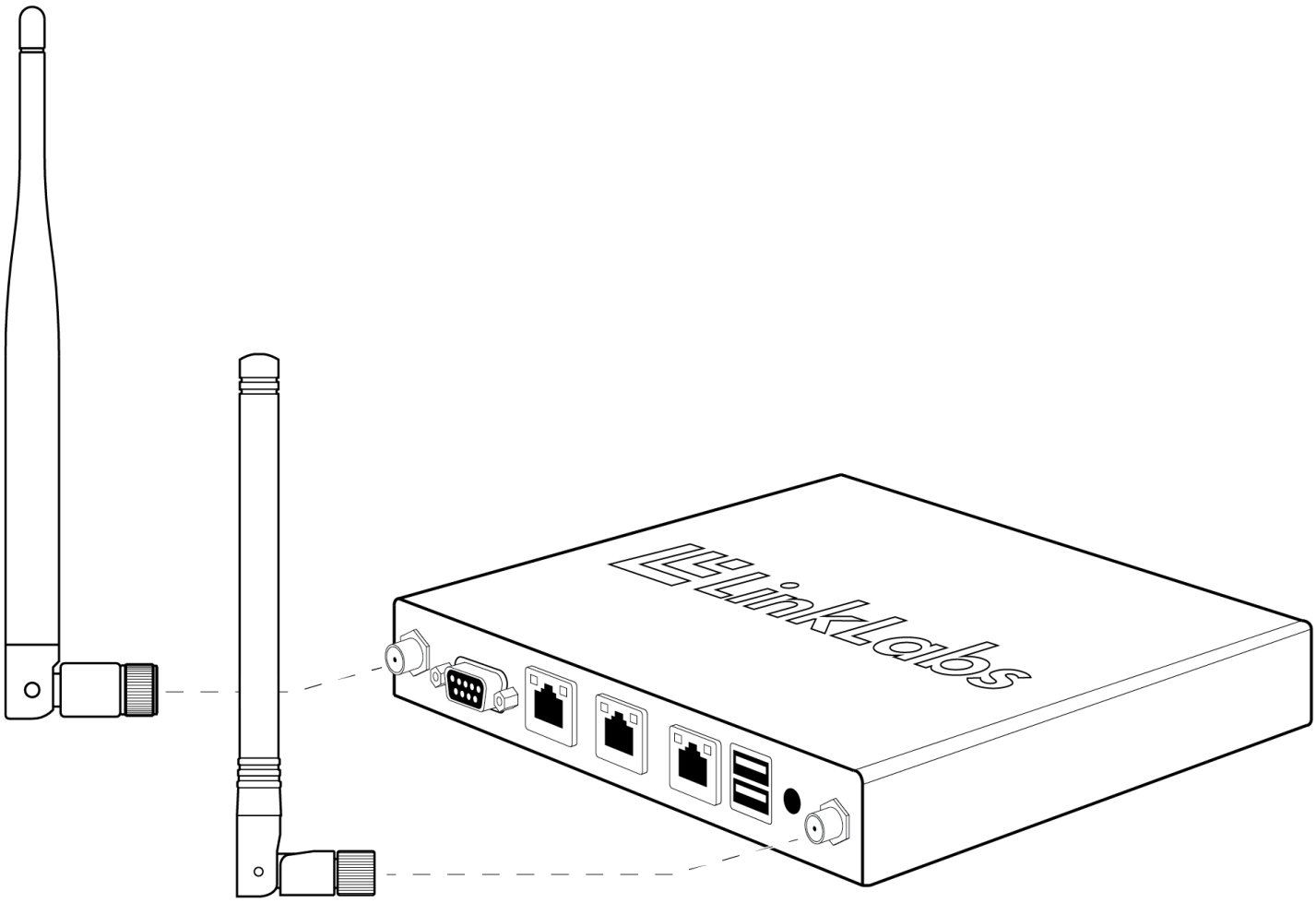
Quick Start Guide

Demo Videos

Setting up your Gateway

Getting Started with the Evaluation Board

Step 1: Turn on the gateway



Connect the antennas.

Connect the 915-MHz antenna to the gateway's **UHF** antenna jack and the Wifi antenna to the **Wifi** jack.

Apply power.

Connect one end of the wall-plug adapter to the gateway's **Power** port and the other end to an electrical outlet.

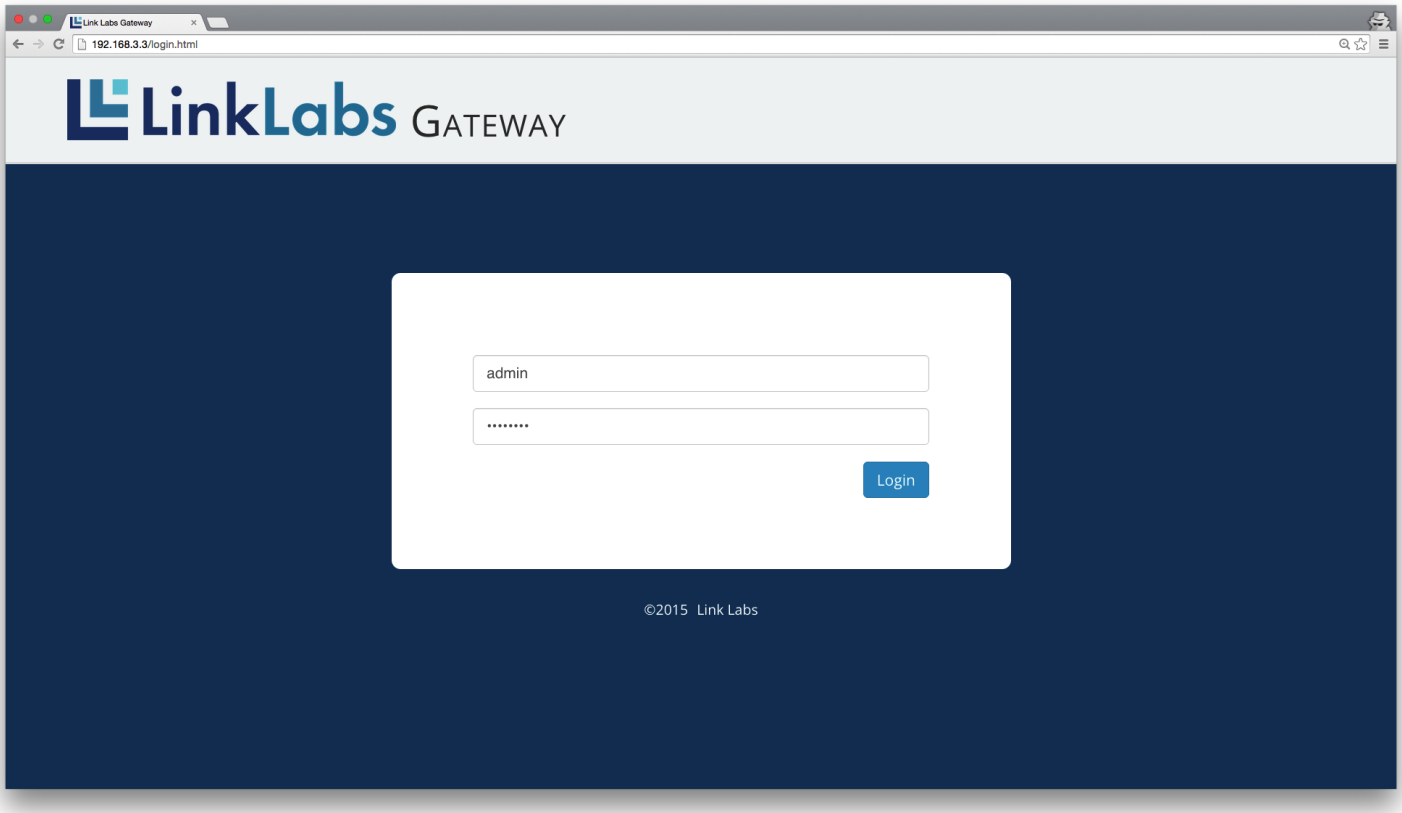
Step 2: Access the gateway's local webpage

Connect a PC.

Wait a minute for the gateway to bootstrap, then connect a PC to the local Ethernet jack (the middle one) using the provided Ethernet cable.

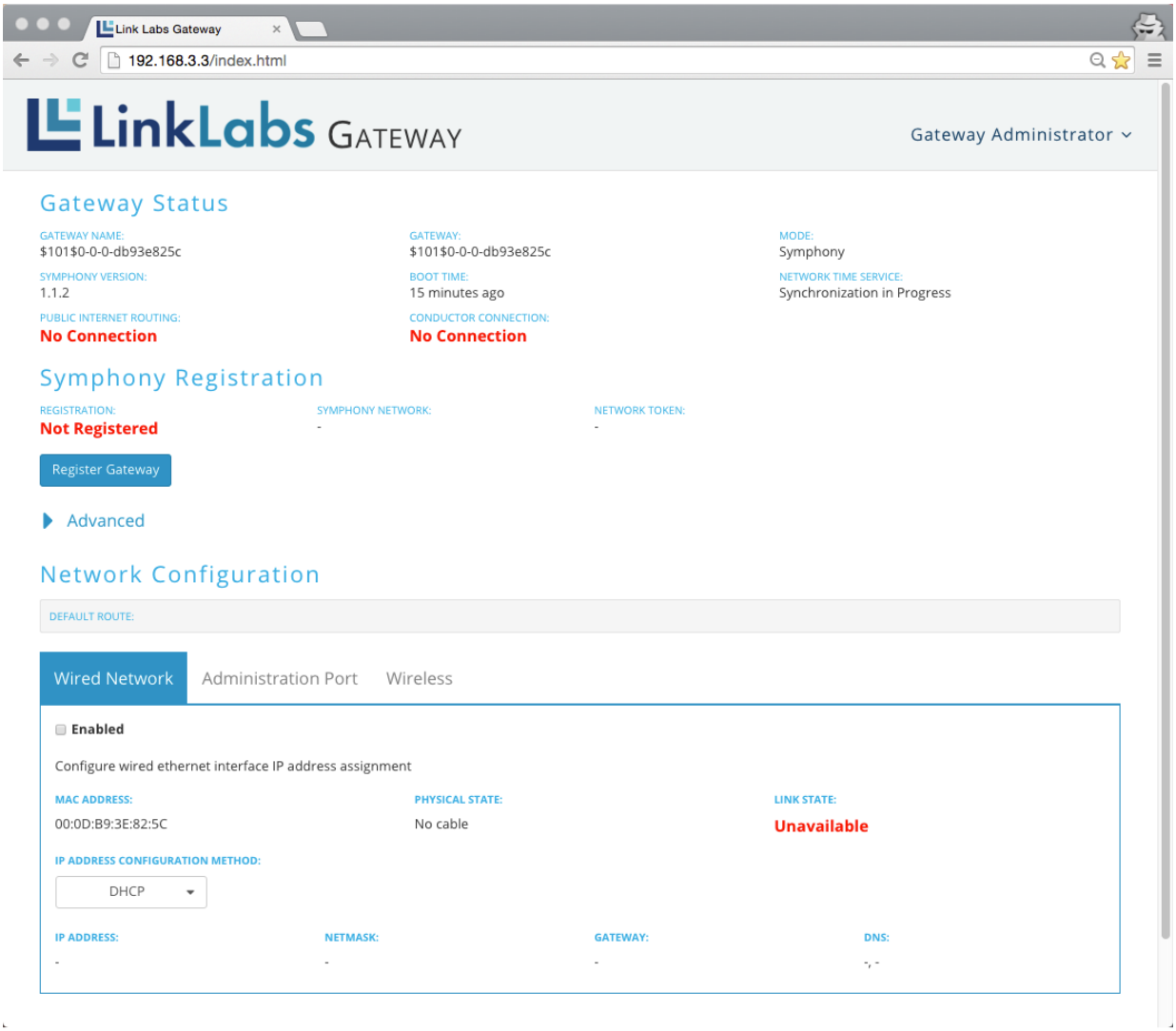
Navigate to the local webpage.

On the connected PC, open a browser and navigate to **192.168.3.3**. Log in using username "**admin**" and password "**password**."



The gateway's local webpage appears.

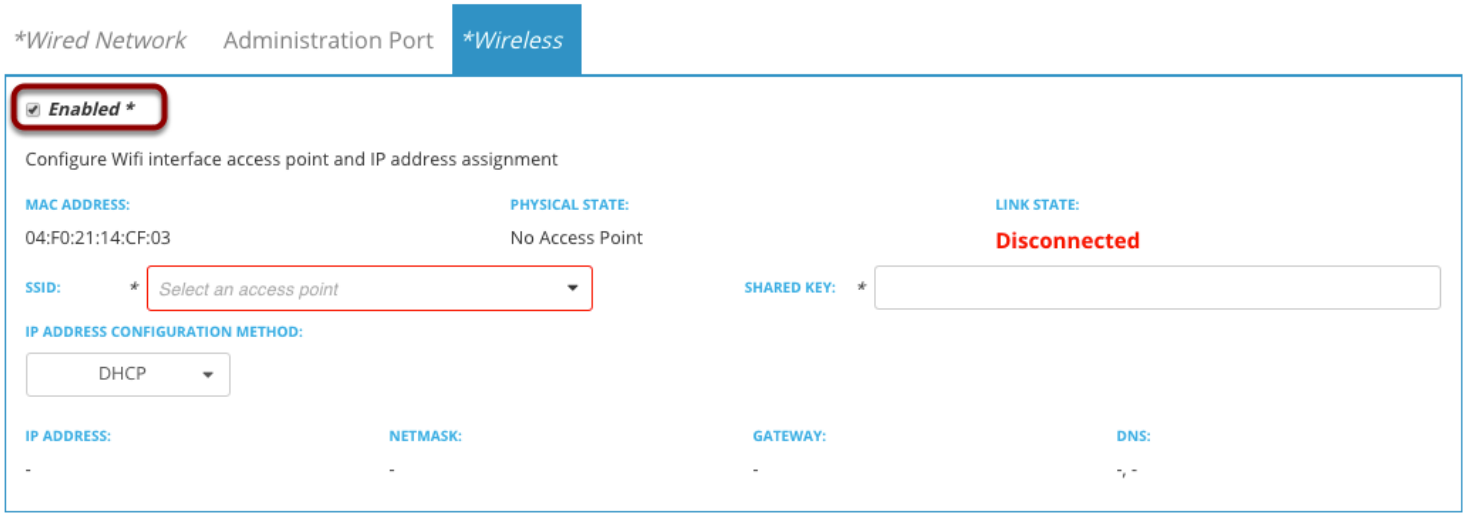
The local webpage provides an interface to view the status of the gateway, to connect it to the Internet, and to register the gateway with a Conductor account.



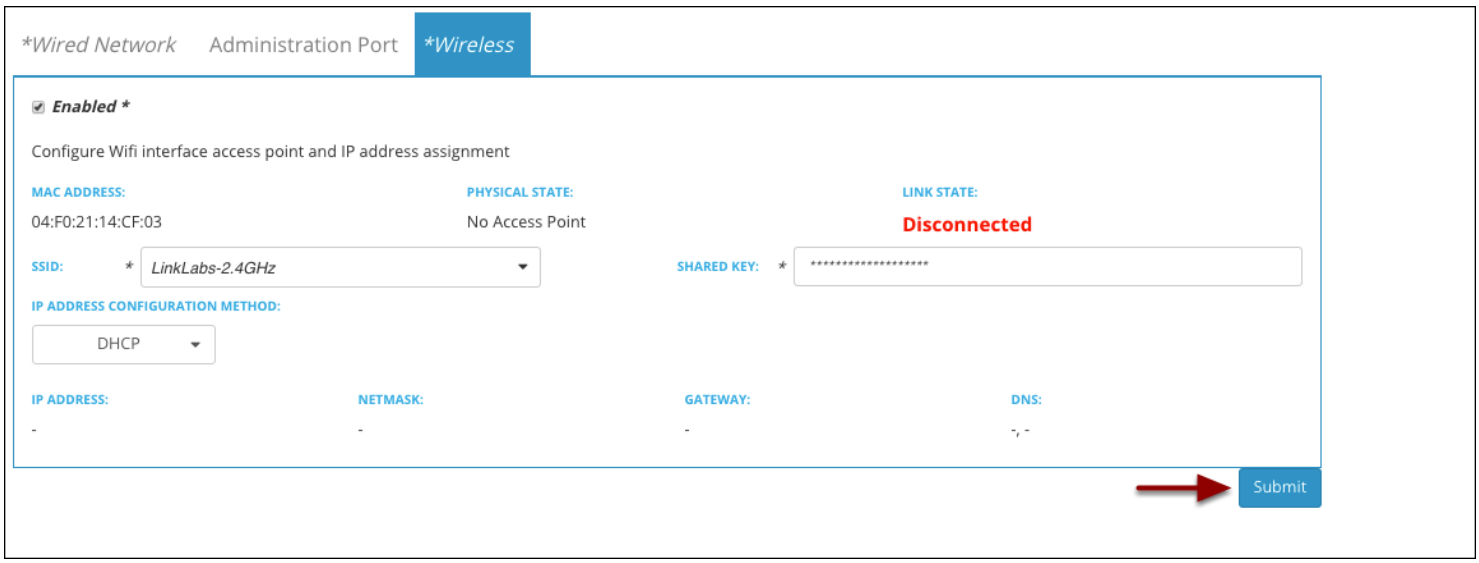
Step 3: Connect the gateway to the Internet

To connect using WiFi...

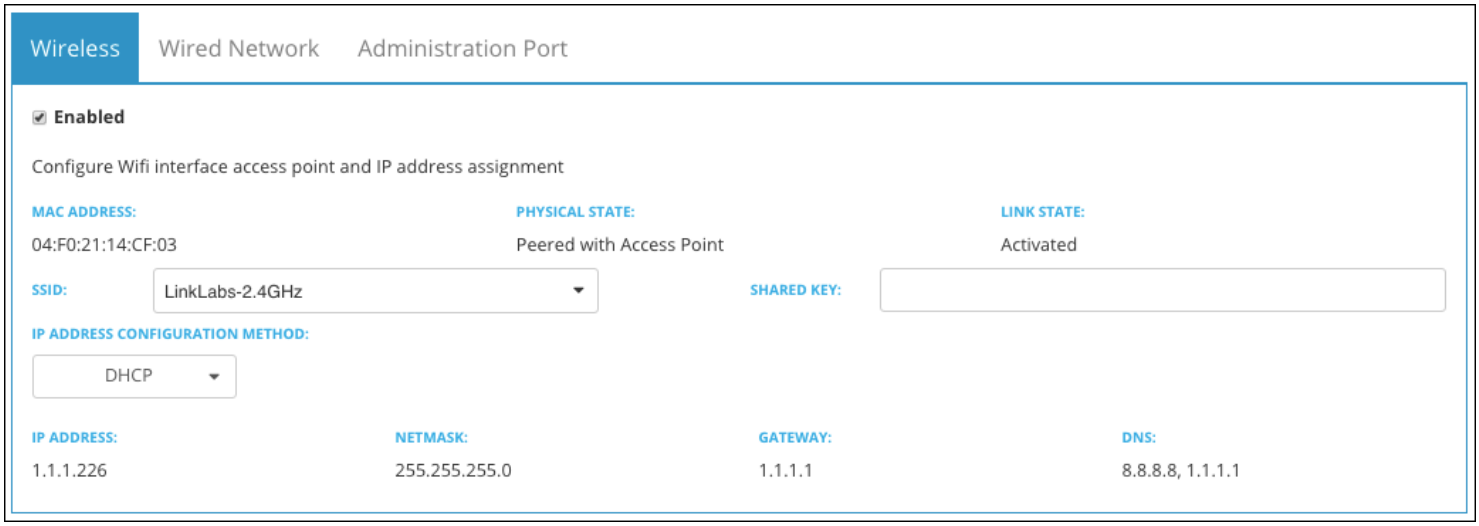
In the **Wireless** tab of the local webpage, select the **Enabled** checkbox.



Select a Wifi network from the **SSID** dropdown listbox and enter the password in the **SHARED KEY** editbox. Click **Submit**.



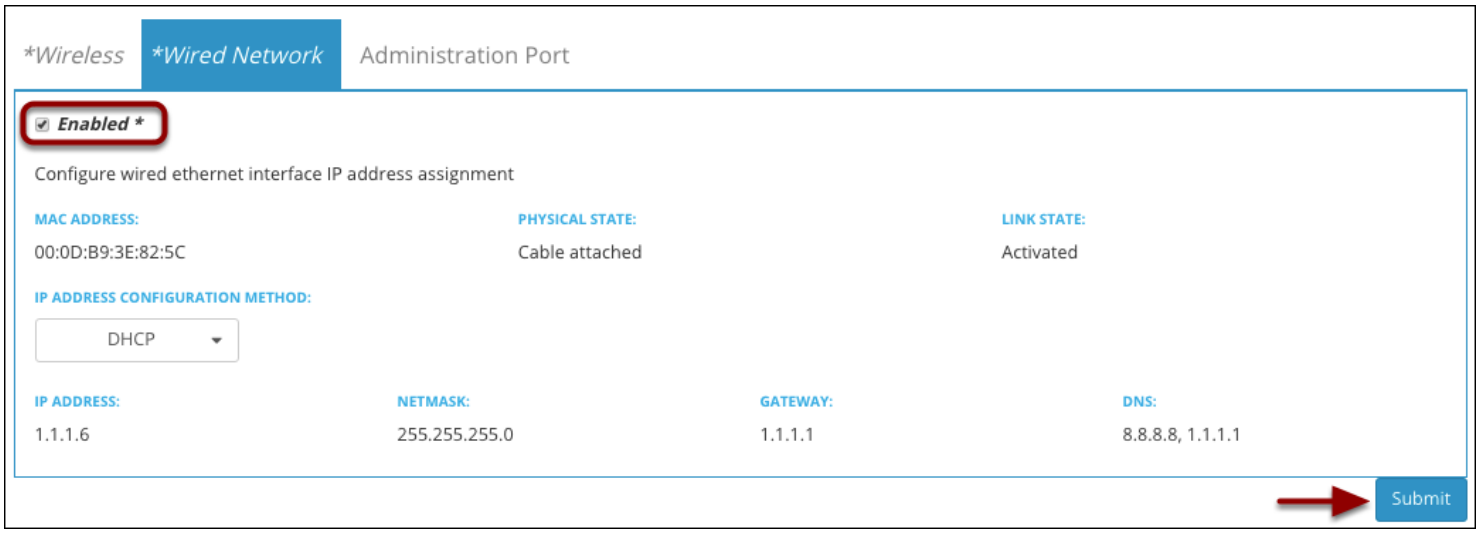
After a few moments, the **Wireless** tab updates with the connection information.



To connect via wired Ethernet...

Connect a DHCP-enabled network to the gateway's **LAN** Ethernet jack (the one closest to the serial connector).

In the **Wired Network** tab, select the **Enabled** checkbox. Click **Submit**.



After a few moments, the **Wired Network** tab updates with the connection information.

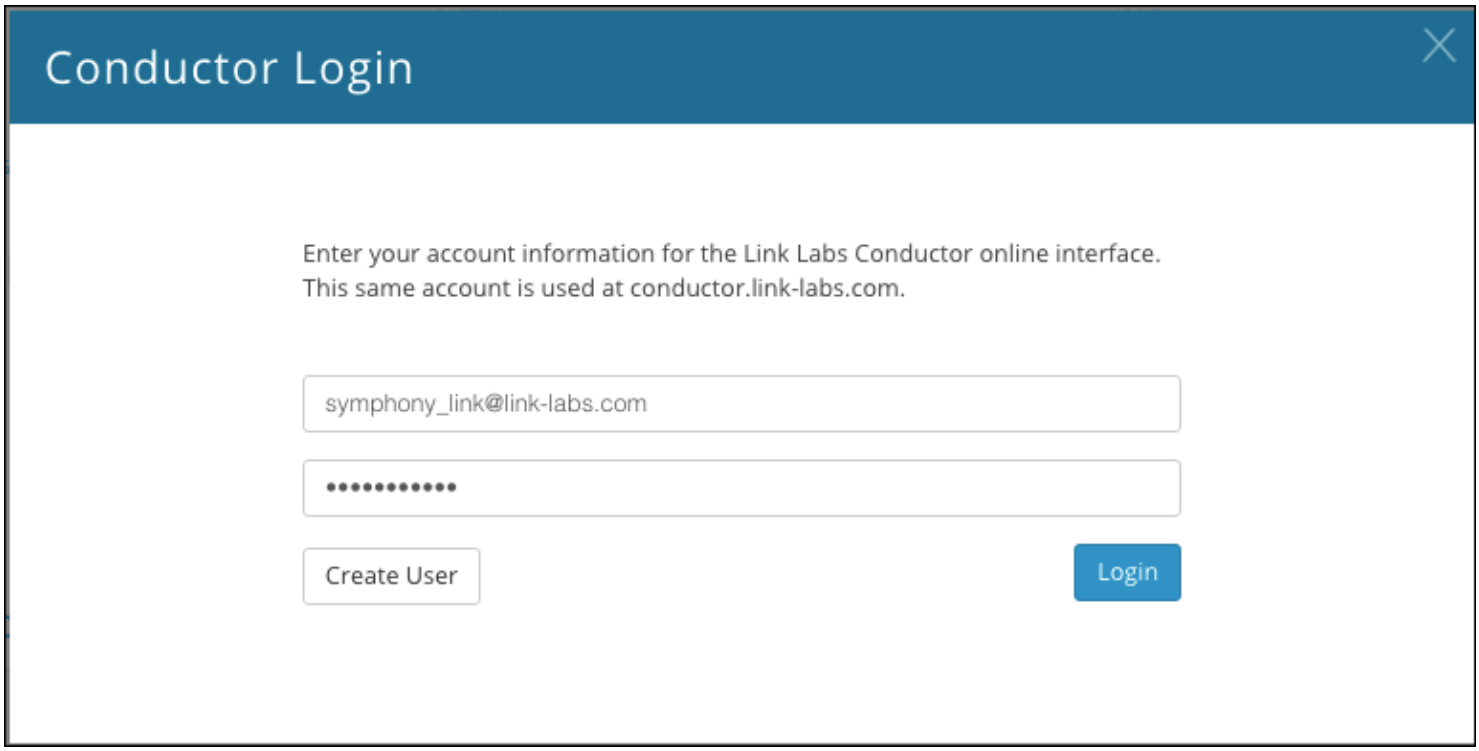
Step 4: Register the gateway with Conductor

This step connects your gateway to your web-based Conductor account.

Register the gateway.

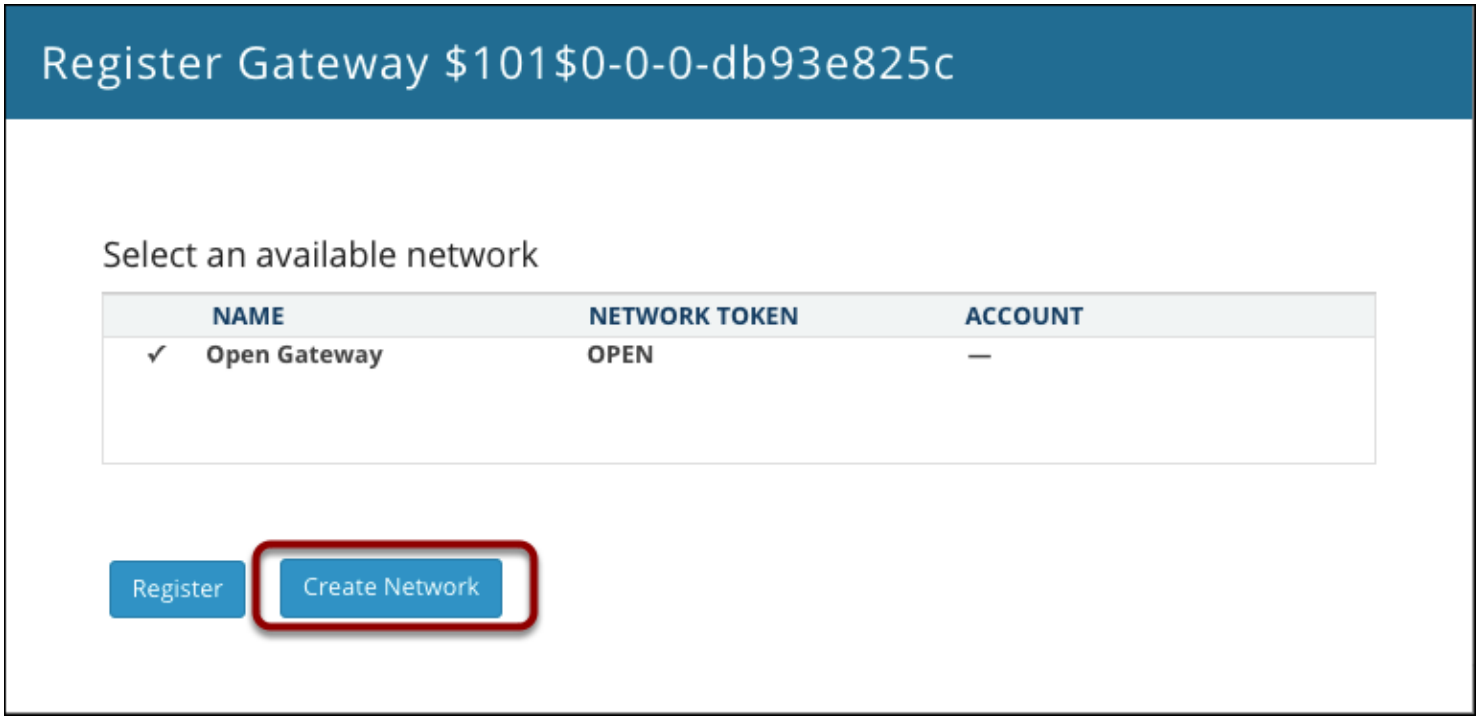
Once the gateway is connected to the Internet, click the **Register Gateway** button in the **Symphony Registration** section of the local webpage.

The **Conductor Login** prompt appears. Enter your credentials and click the **Login** button. Or, if you do not have a Conductor account, click the **Create User** button and follow the directions to make an account.

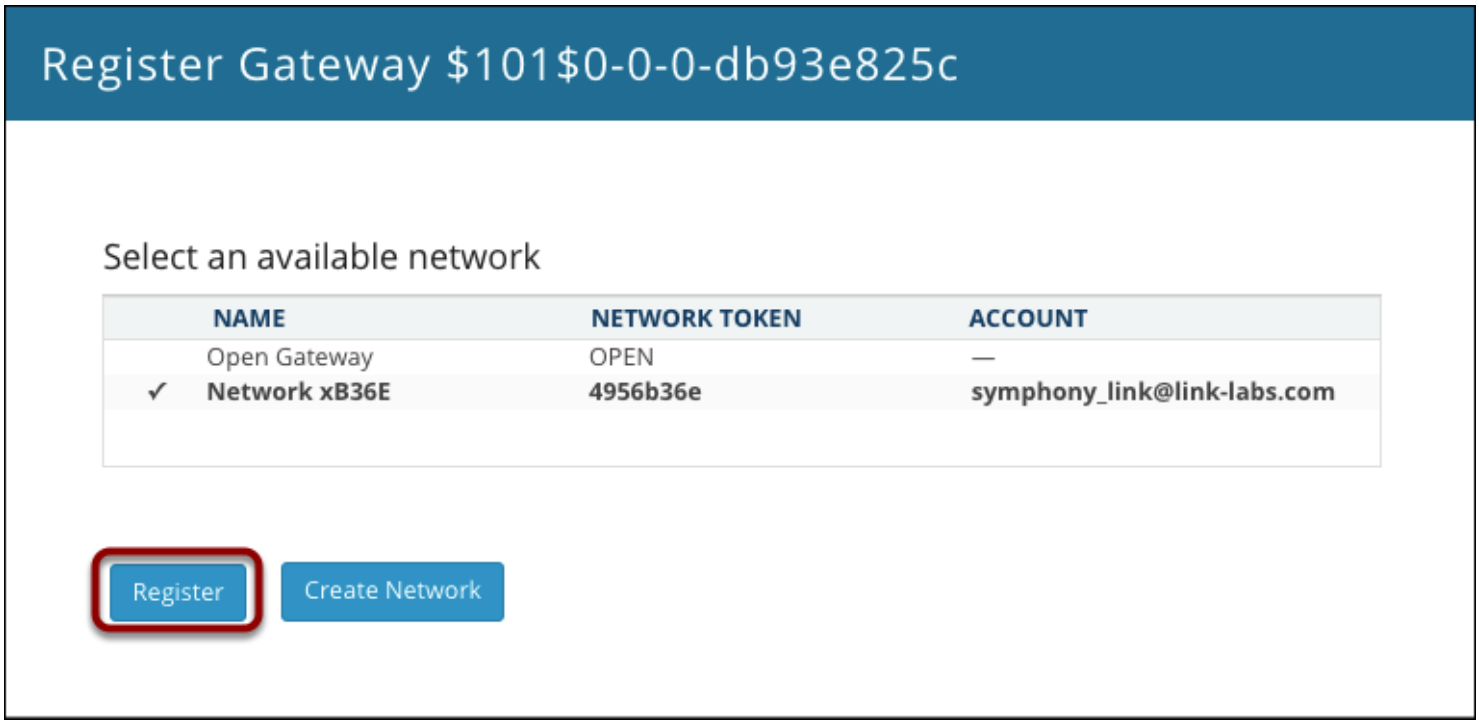


The **Register Gateway** prompt appears.

In this example, we're going to register the gateway with a new Symphony Link Network. (But if you want, you can simply register the gateway with the **Open Gateway** network.) Click the **Create Network** button.



Conductor populates a new, unique network to the list. In this example, it is **Network xB36E**. (We'll rename it later.) Click the **Register** button.

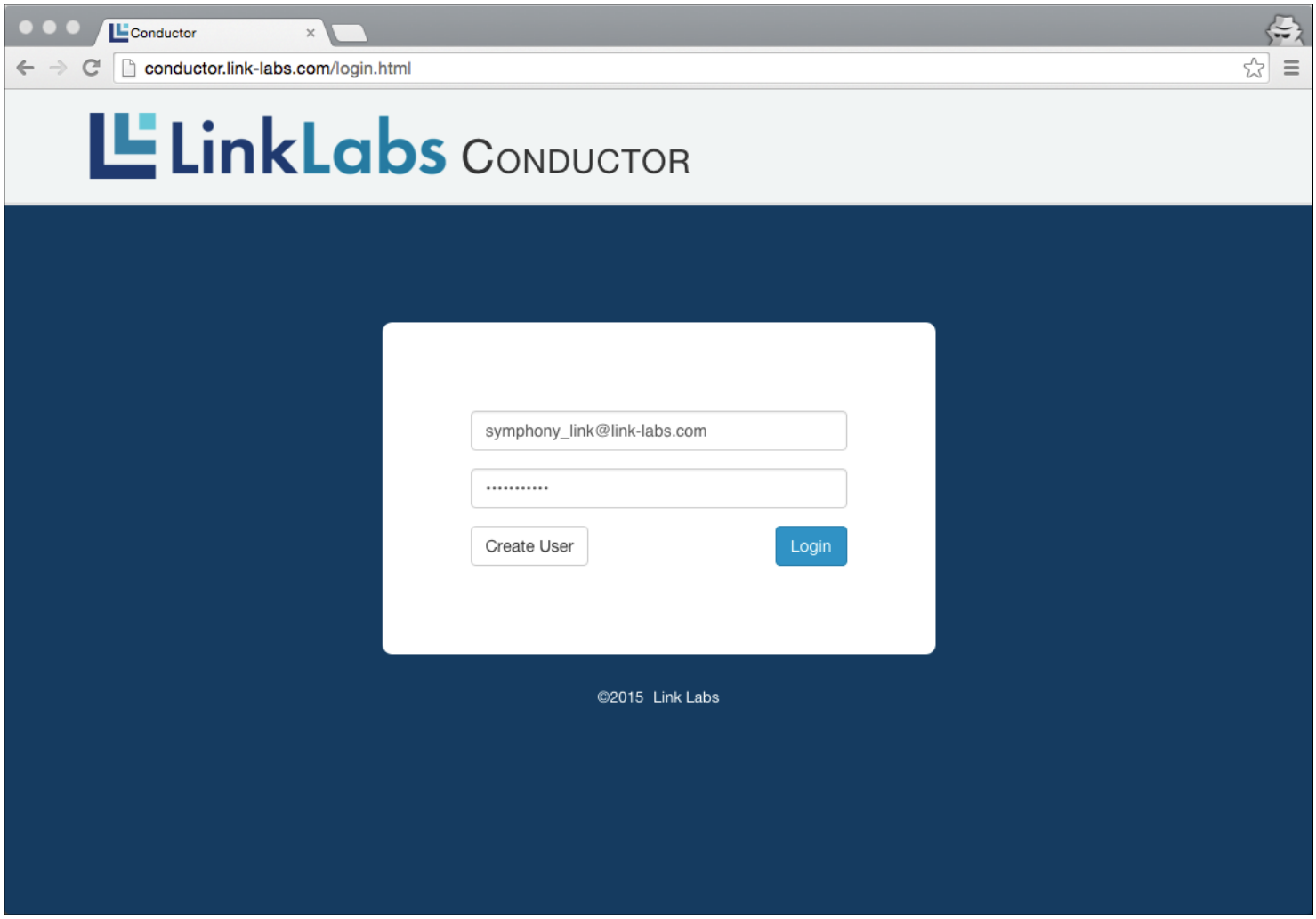


The prompt disappears and the **Symphony Registration** section of the local webpage updates. It shows the gateway is registered with the newly created network. (You may need to refresh your browser.)

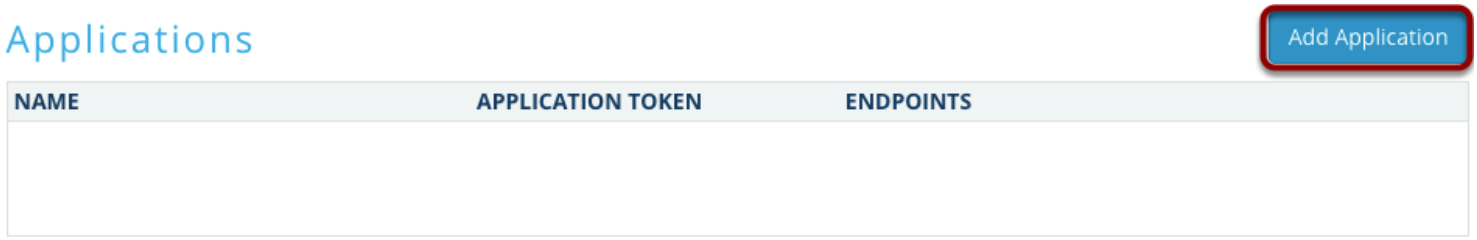
Step 5: Organize your Conductor account

Add a new application to your Conductor account.

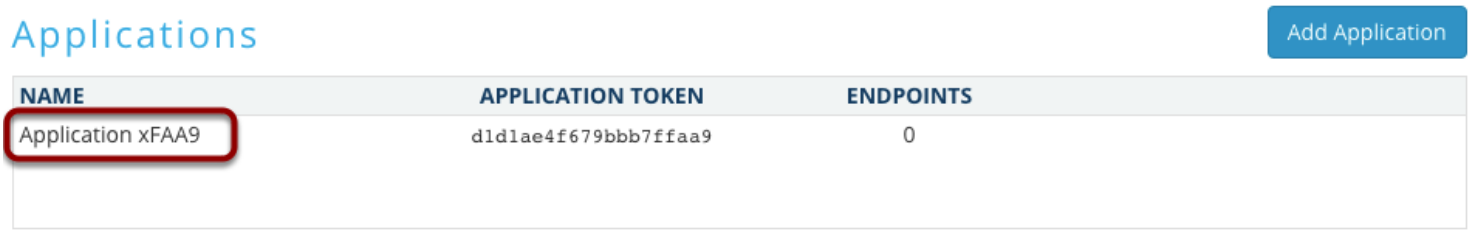
Open a browser and navigate to conductor.link-labs.com. Log in using your account credentials.



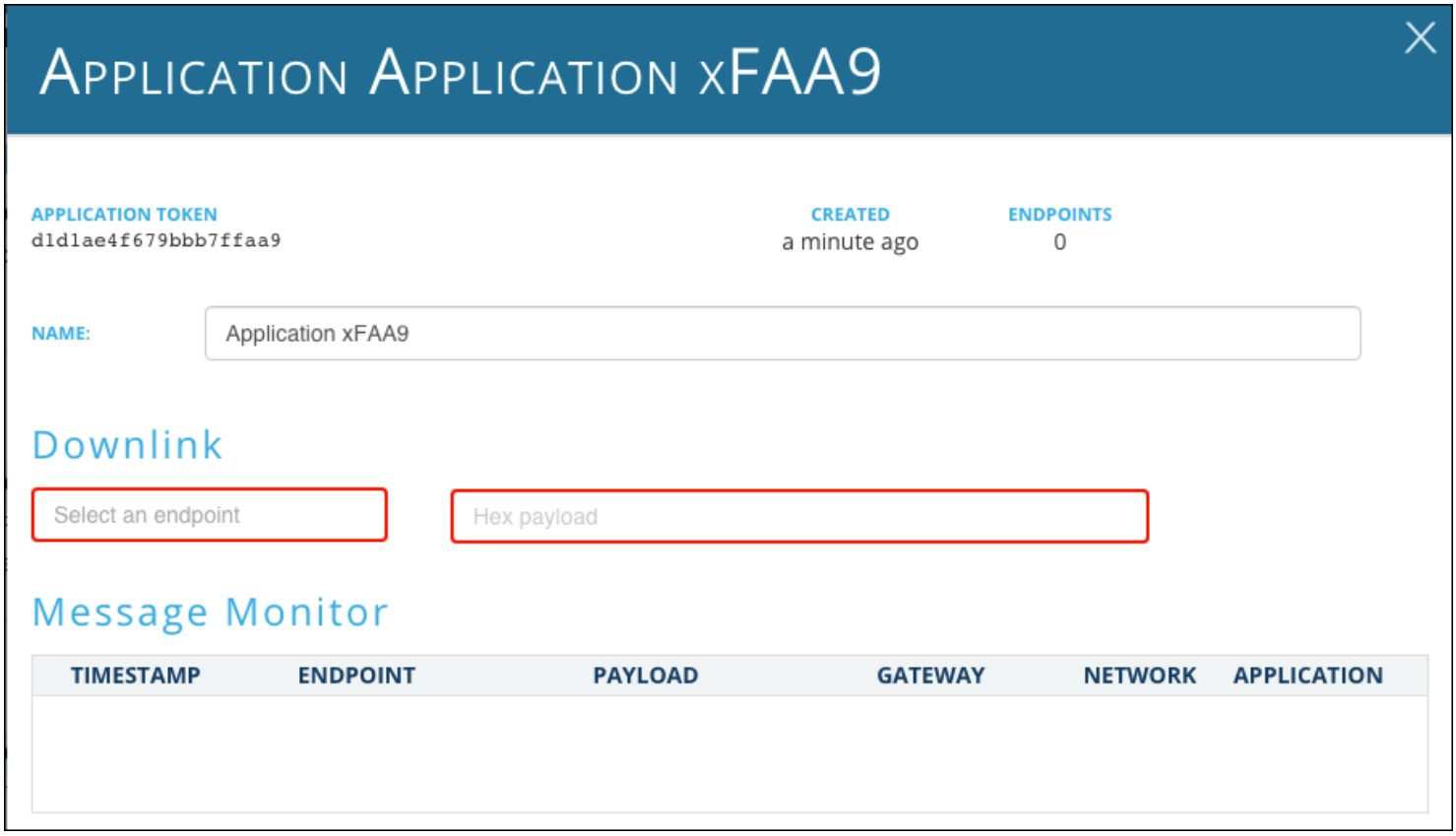
In the **Applications** section of your Conductor account, click the **Add Application** button.



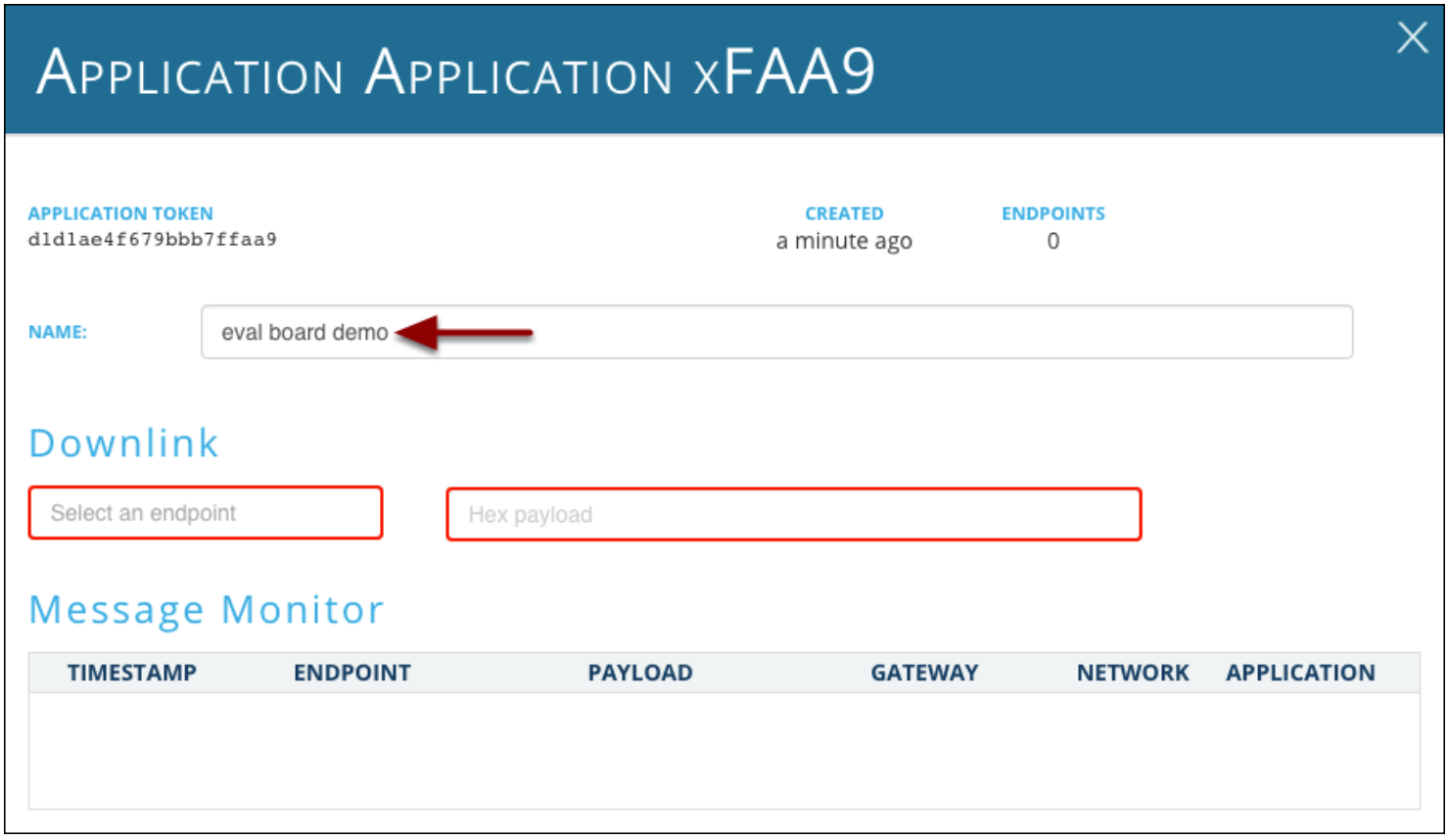
Conductor generates a new, unique Application Token and adds it to the list. In this example, the new application is called **Application xFAA9**.



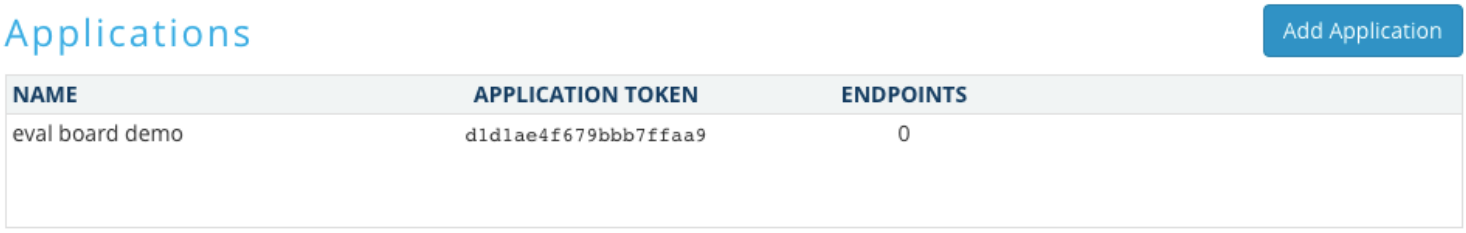
Click on the name of the new application. The **Application** pop-up window appears.



Rename the new application by entering "eval board demo" (or whatever you would like to call it) in the **NAME** field of the pop-up window.



Exit by clicking outside the pop-up window. The new name of the application updates to the list of applications.

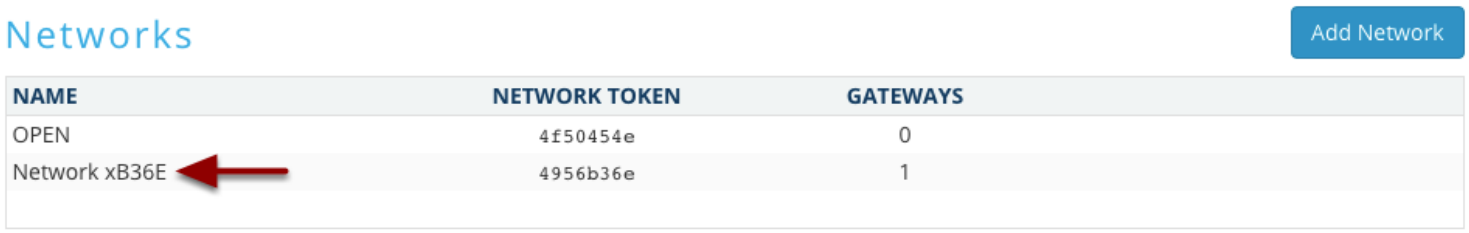


Record the Application Token of the "eval board demo" application -- we'll use it later. In this example, the Application Token is

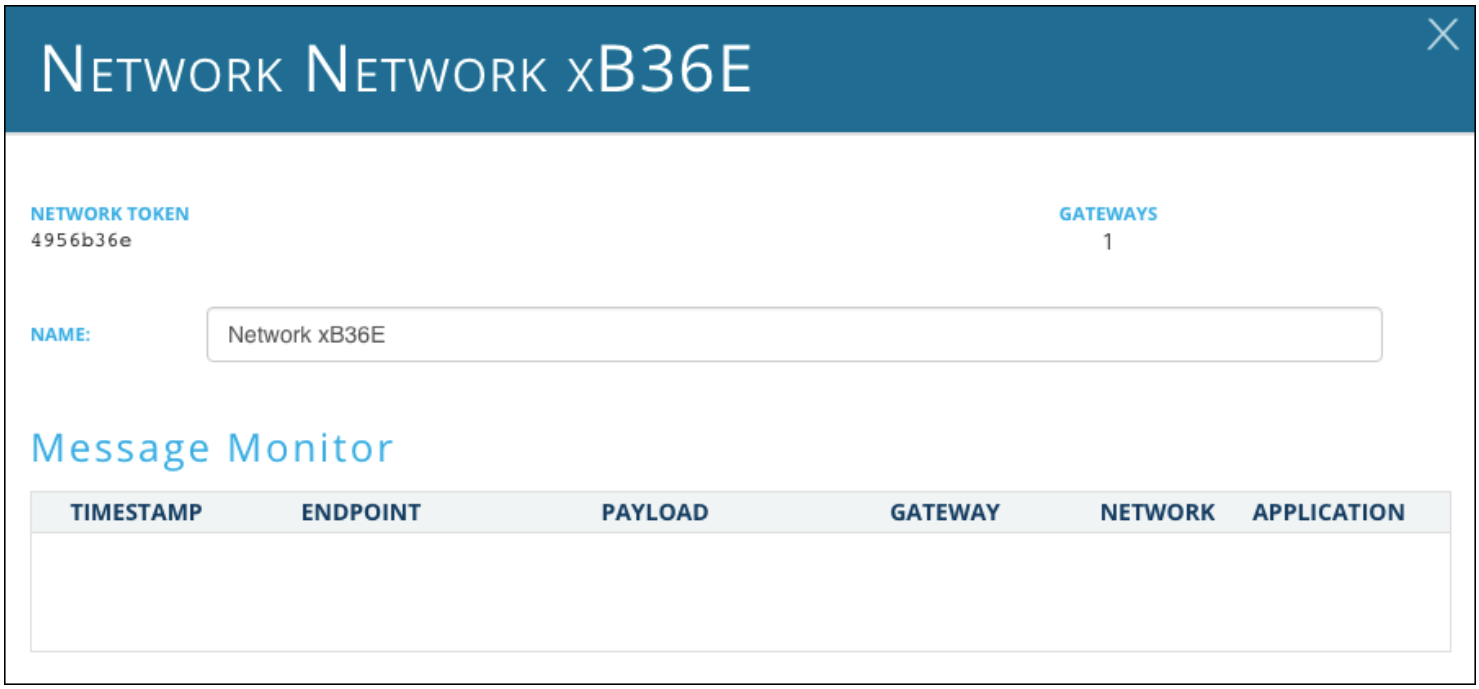
```
d1d1ae4f679bbb7ffaa9
```

Rename the new Symphony Link network you created in Step 4.

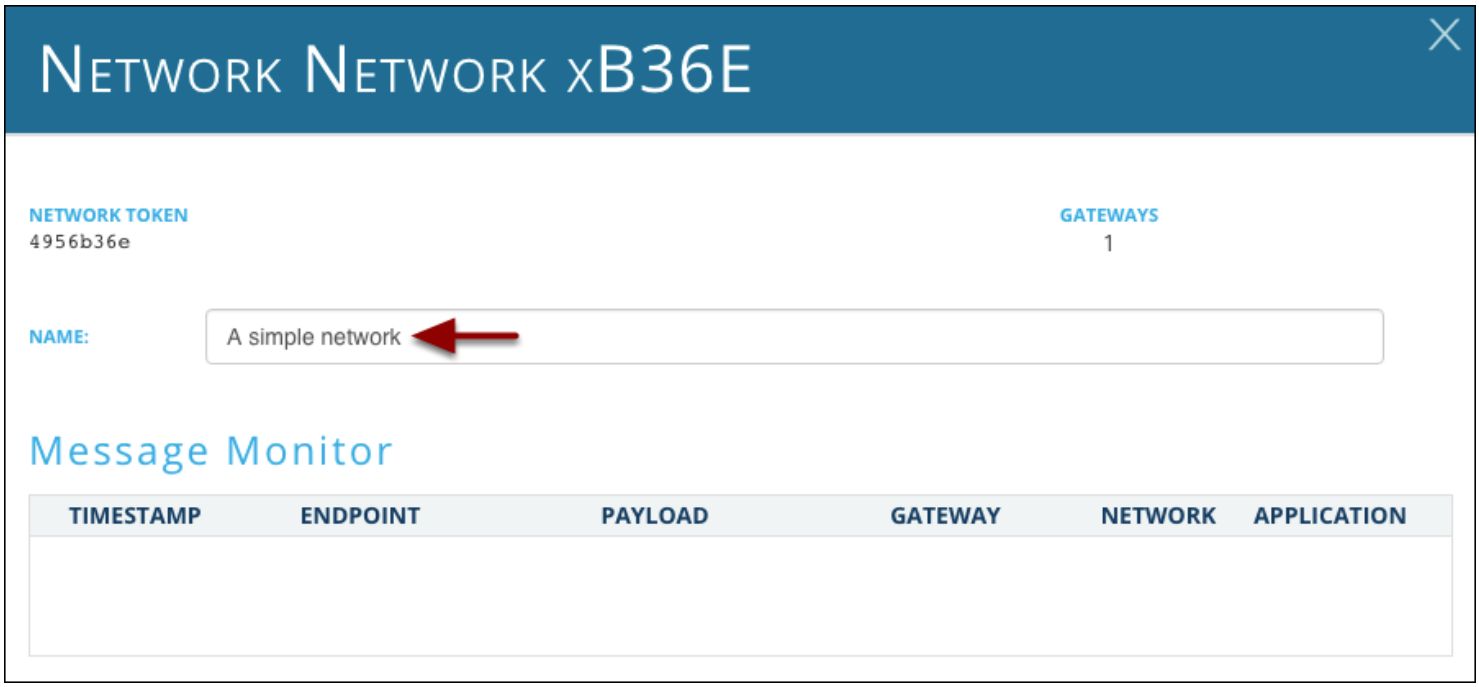
Click on the name of the new network in the **Networks** section of your Conductor account.



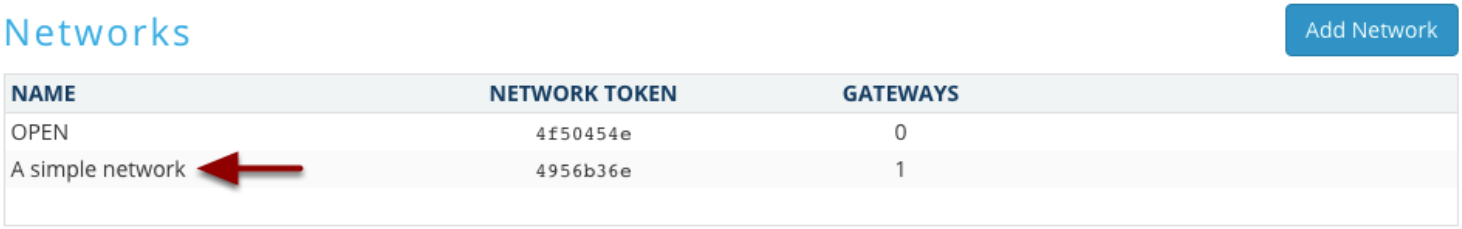
The **Network** pop-up window appears.



Rename the network by entering "A simple network" (or whatever you would like to call it) into the **NAME** field of the pop-up window.



Click outside the pop-up window to exit it. The new name updates to the list of networks. (You may need to refresh your browser.)



Record the Network Token associated with "A simple network" -- we'll use it later. In this example, it is:

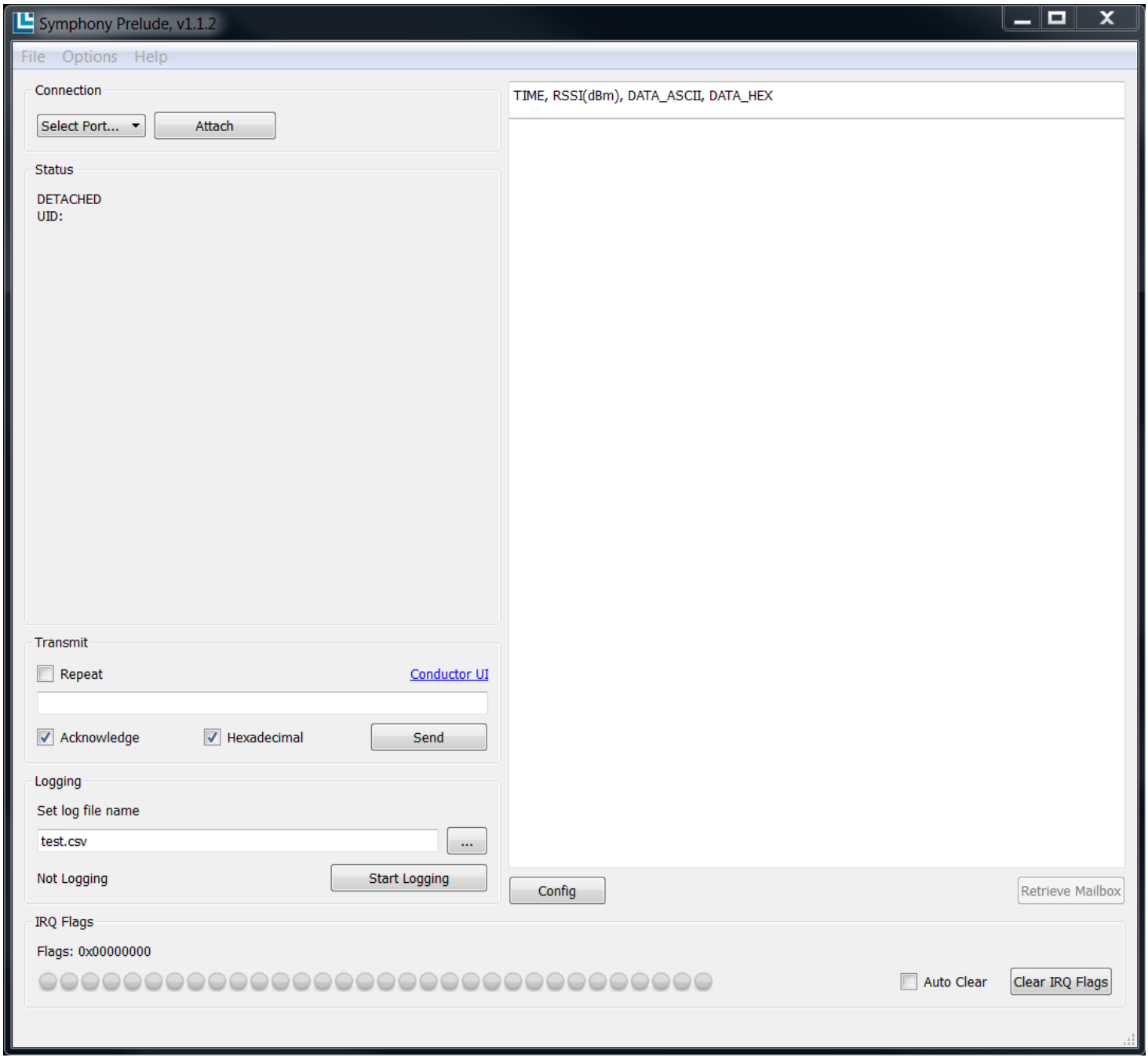
```
4956b36e
```

Step 6: Setup the USB-UART evaluation board

Install Prelude.

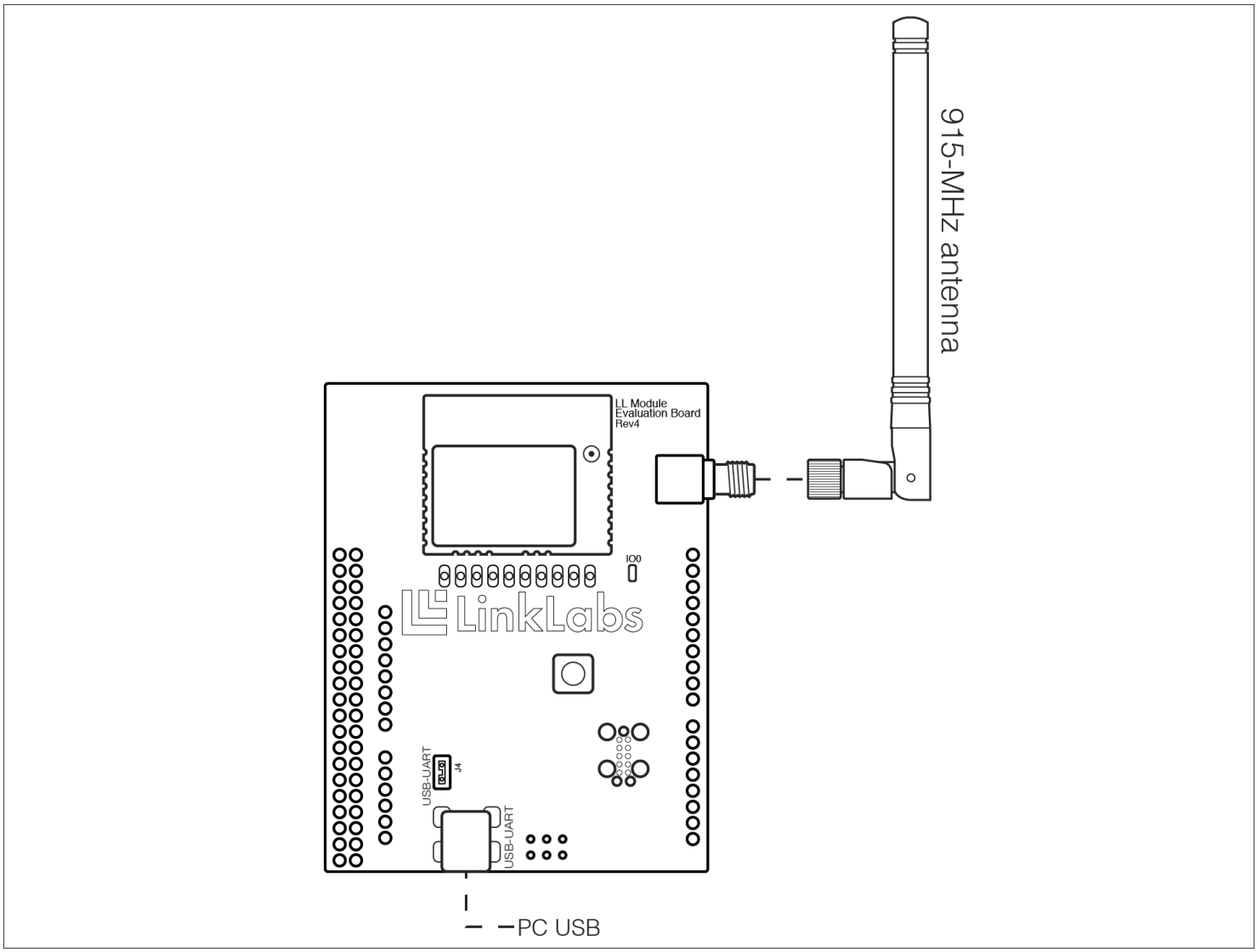
Download and run the latest Windows installer for Prelude. Follow the on-screen instructions to install Prelude to your PC.

When installation is finished, launch the Prelude application.



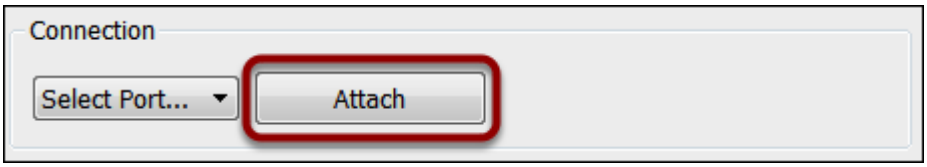
Connect the evaluation board.

Connect the evaluation board to a PC using a mini-USB cable.



Once connected, a red LED on the evaluation board lights up. This LED lights up anytime the Symphony Link Module has set one or more interrupt request flags. (In this case, the LED indicates a RESET event has occurred because you just supplied power to the board.)

From the **Select Port** dropdown of Prelude's **Connection** group box, select the COM port associated with the evaluation board. Click **Attach**.

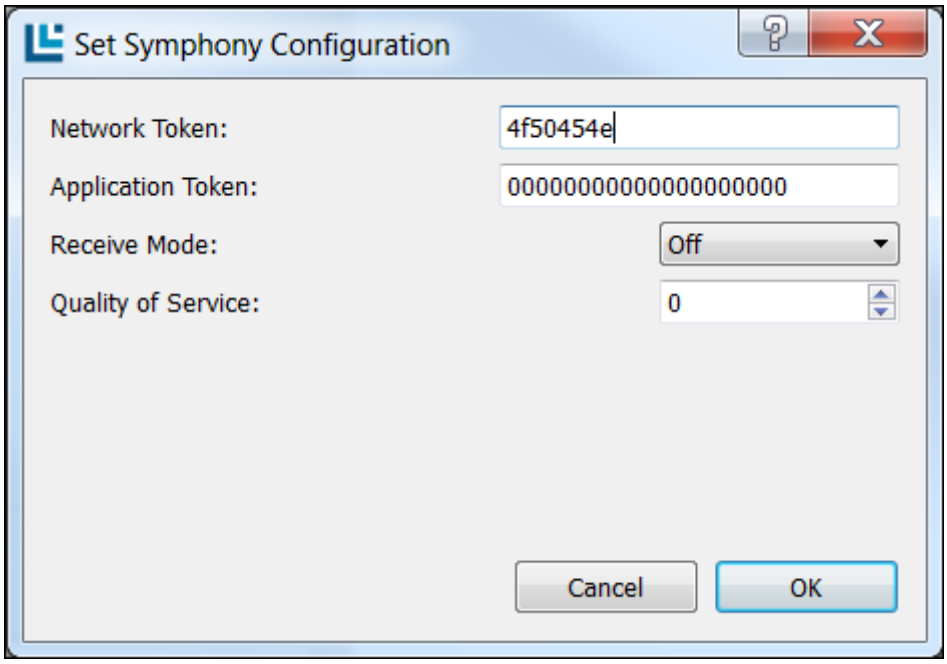


Prelude's **Status** groupbox will begin to update with the module's parameters.

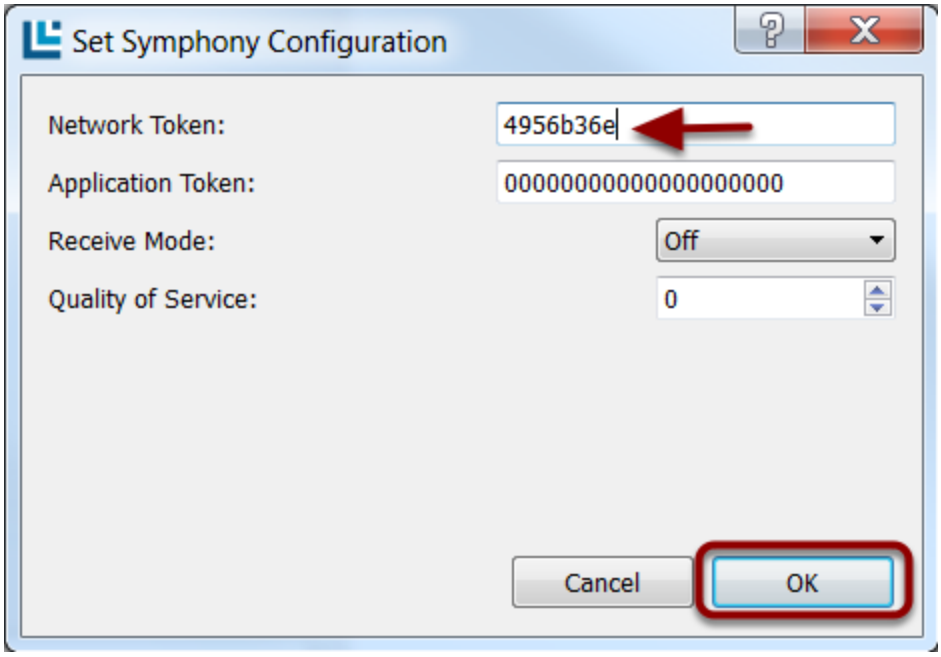
Step 7: Register the module

Shift the module to "A simple network."

From Prelude's **Options** menu, select **Set Symphony Configuration**. The **Set Symphony Configuration** pop-up appears.



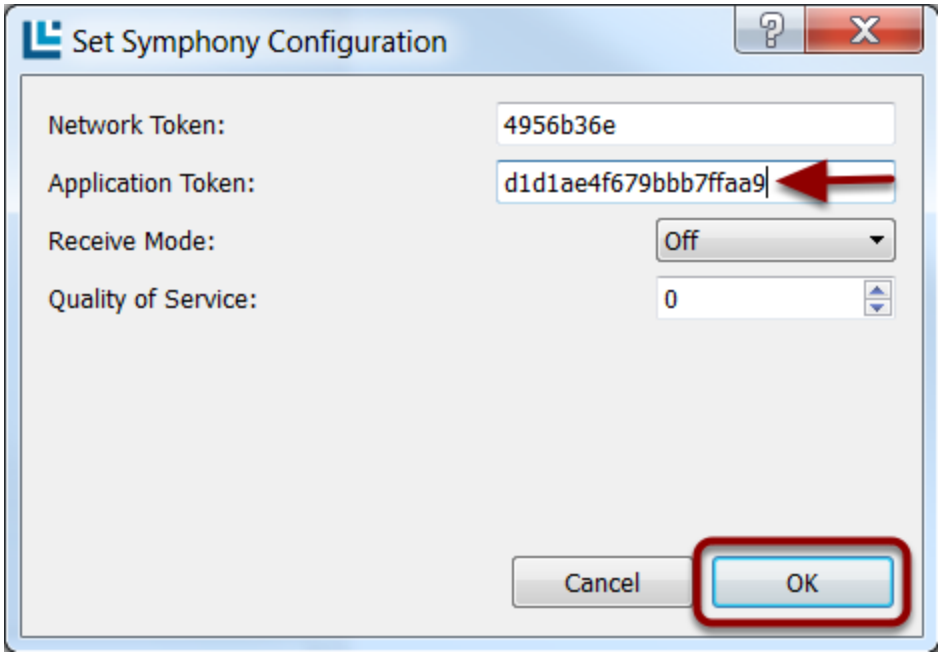
In the **Network Token** editbox, enter the Network Token of "A simple network." Click **OK**.



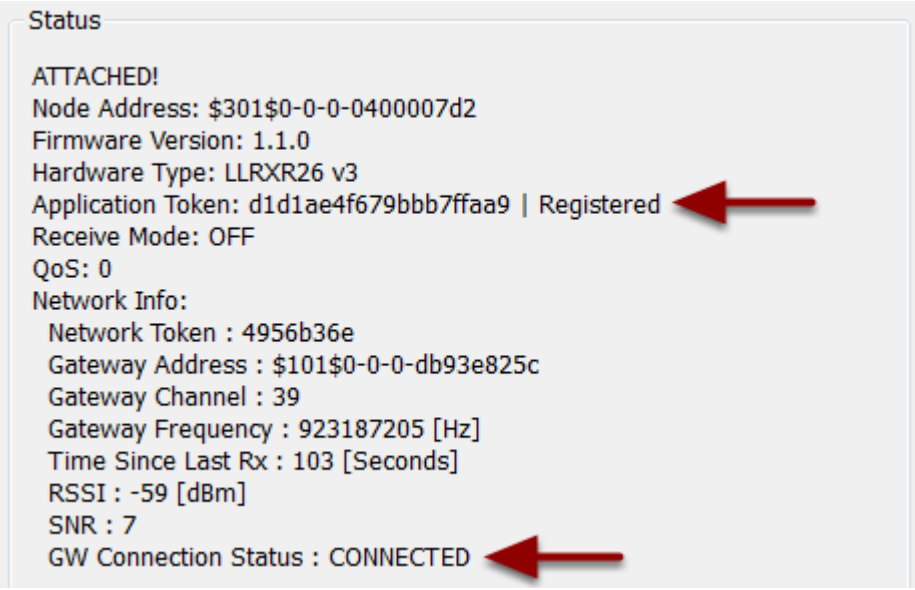
Register the module to the "eval board demo" application.

Re-open the **Set Symphony Configuration** pop-up (**Option** > **Set Symphony Config**).

In the **Application Token** editbox, enter the Application Token of the "eval board demo" application. Click **OK**.



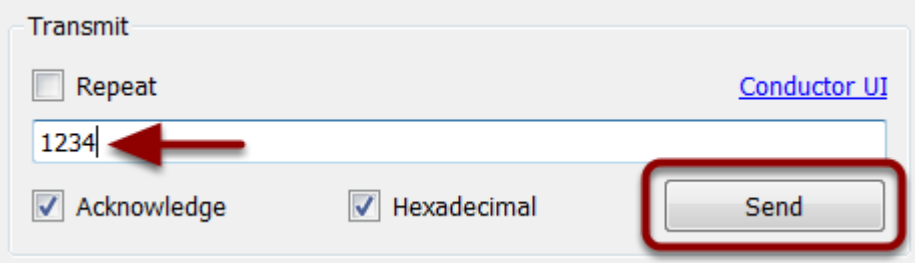
Prelude's **Status** pane begins to update as the Symphony Link Module connects to the gateway and registers its Application Token with Conductor.



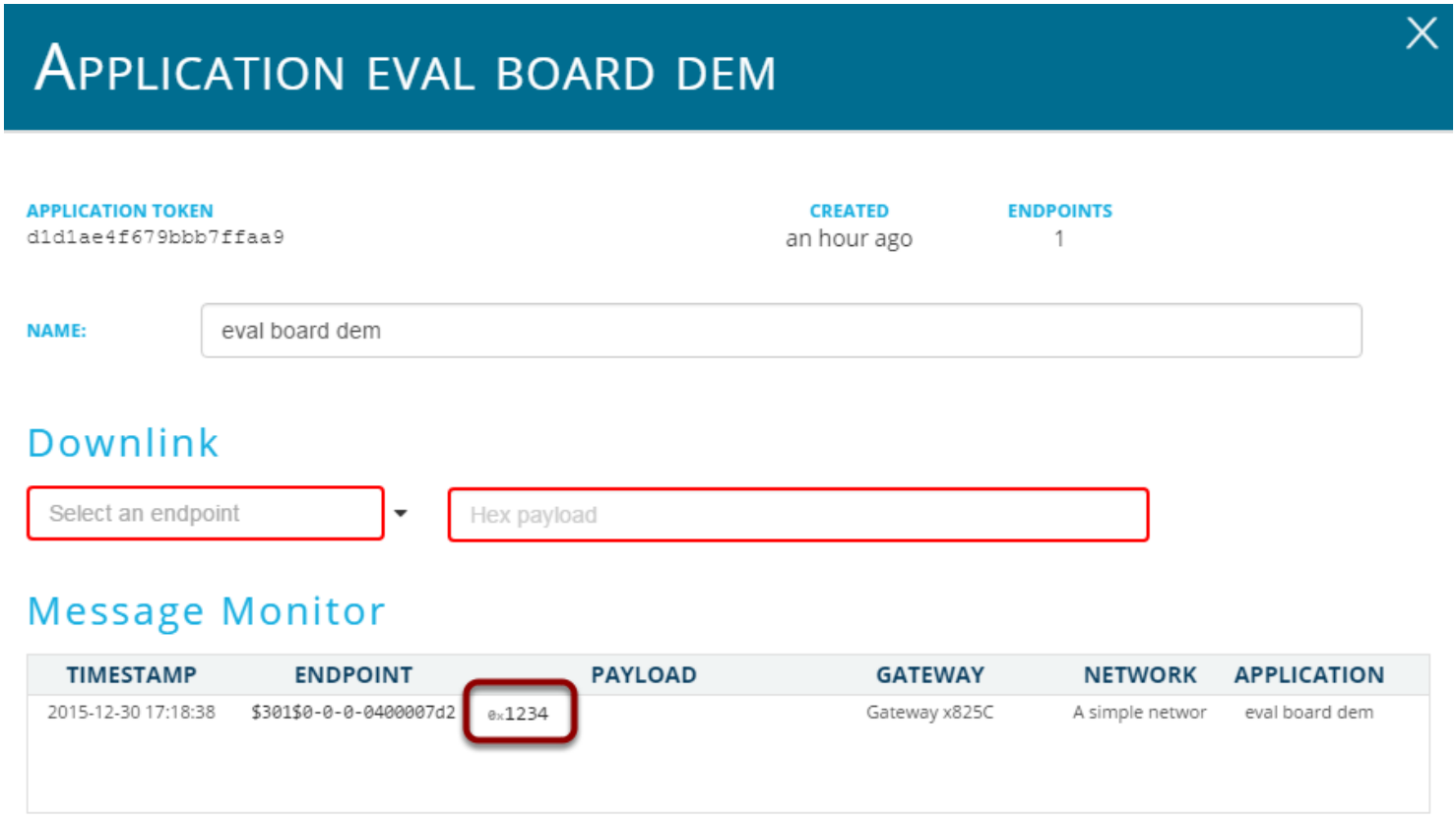
In your Conductor account, the "eval board demo" application now shows that it includes one **ENDPOINT** (meaning one Symphony Link Module).

Step 8: Send an uplink message

In Prelude's **Transmit** groupbox, enter a hex-string message, like "1234". Click **Send**.



In the **Applications** section of your Conductor account, click on the "eval board demo" application to open the application's pop-up window.

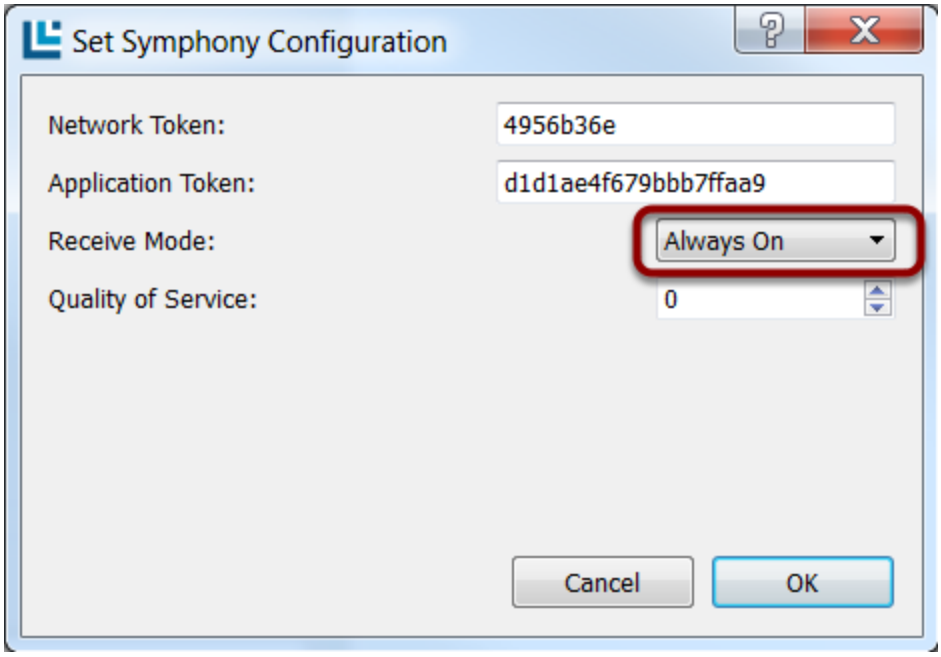


If the uplink operation is successful, the message posts to the **PAYLOAD** section of the **Message Monitor**.

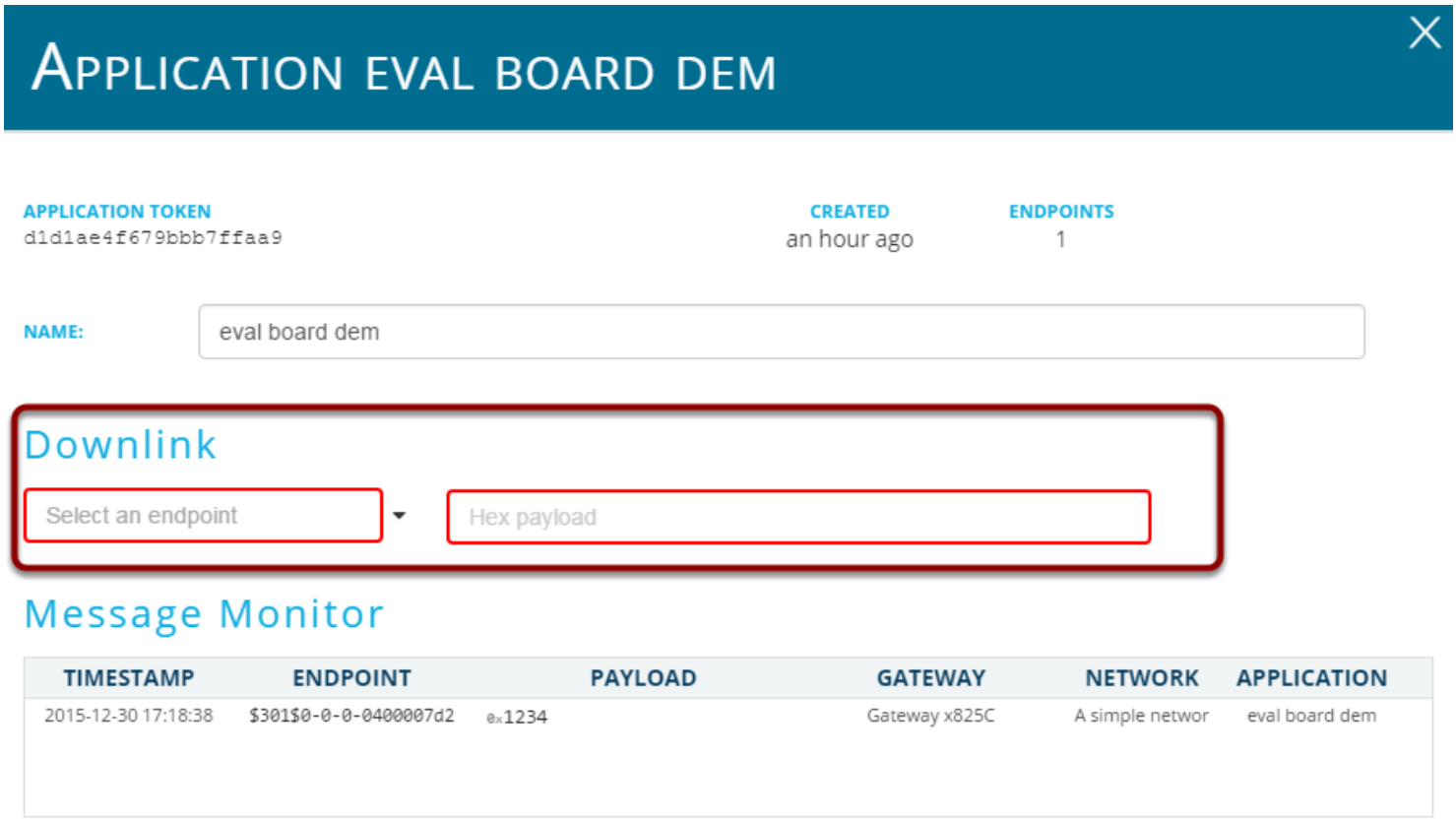
Step 9: Send a downlink message

Downlink using "Downlink Always On" mode...

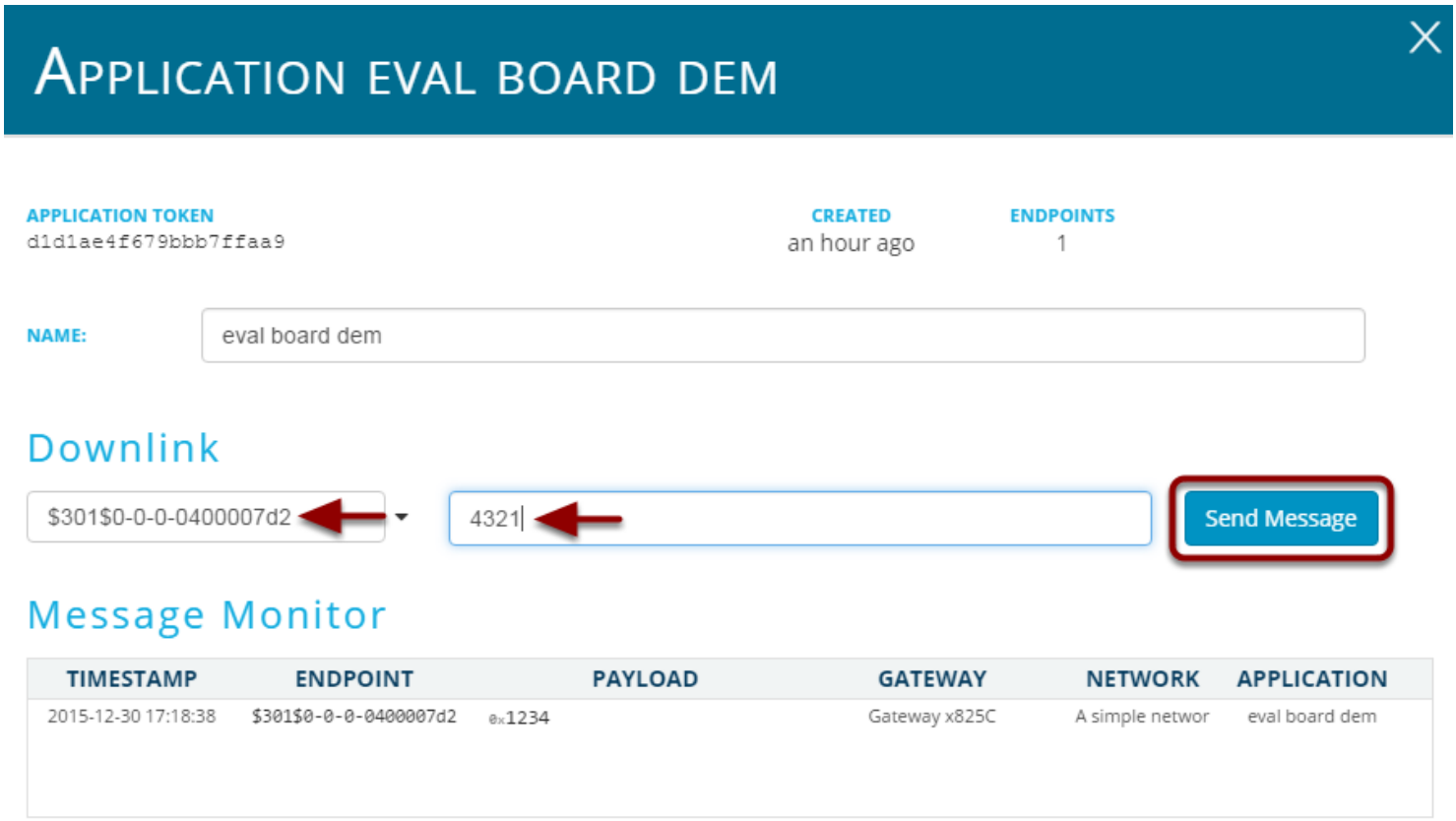
From Prelude's **Options** menu, select **Set Symphony Config**. Set the **Receive Mode** dropdown to **Always On**. Click **OK**.



In your Conductor account, find the **Downlink** section of the "eval board demo" pop-up window.



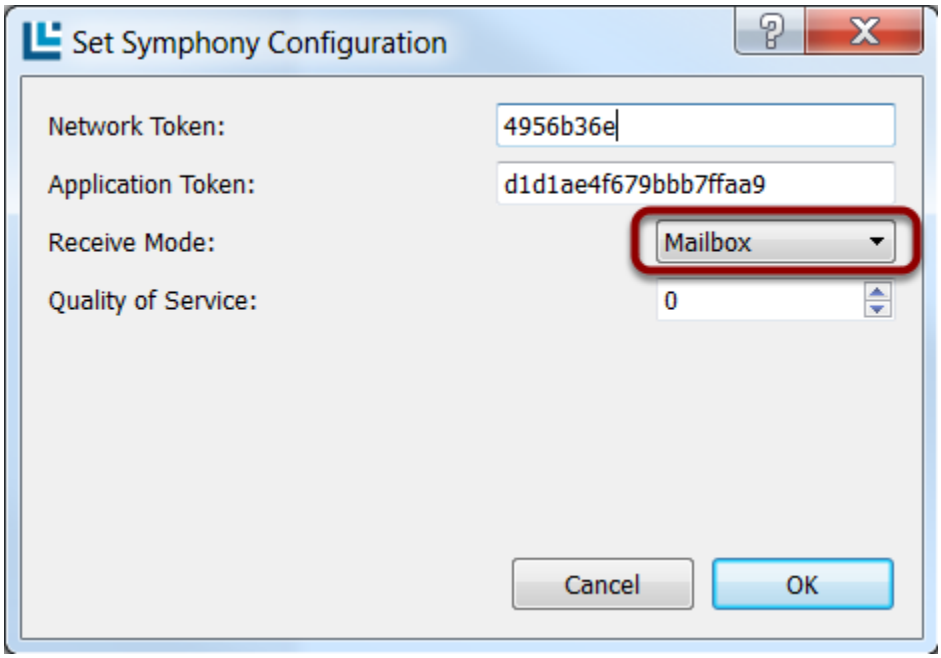
Using the **Select an endpoint** dropdown, select the UUID of the Symphony Link Module on your evaluation board. Enter a hex-string message in the **Hex payload** editbox, like "4321". Press **Send Message**.



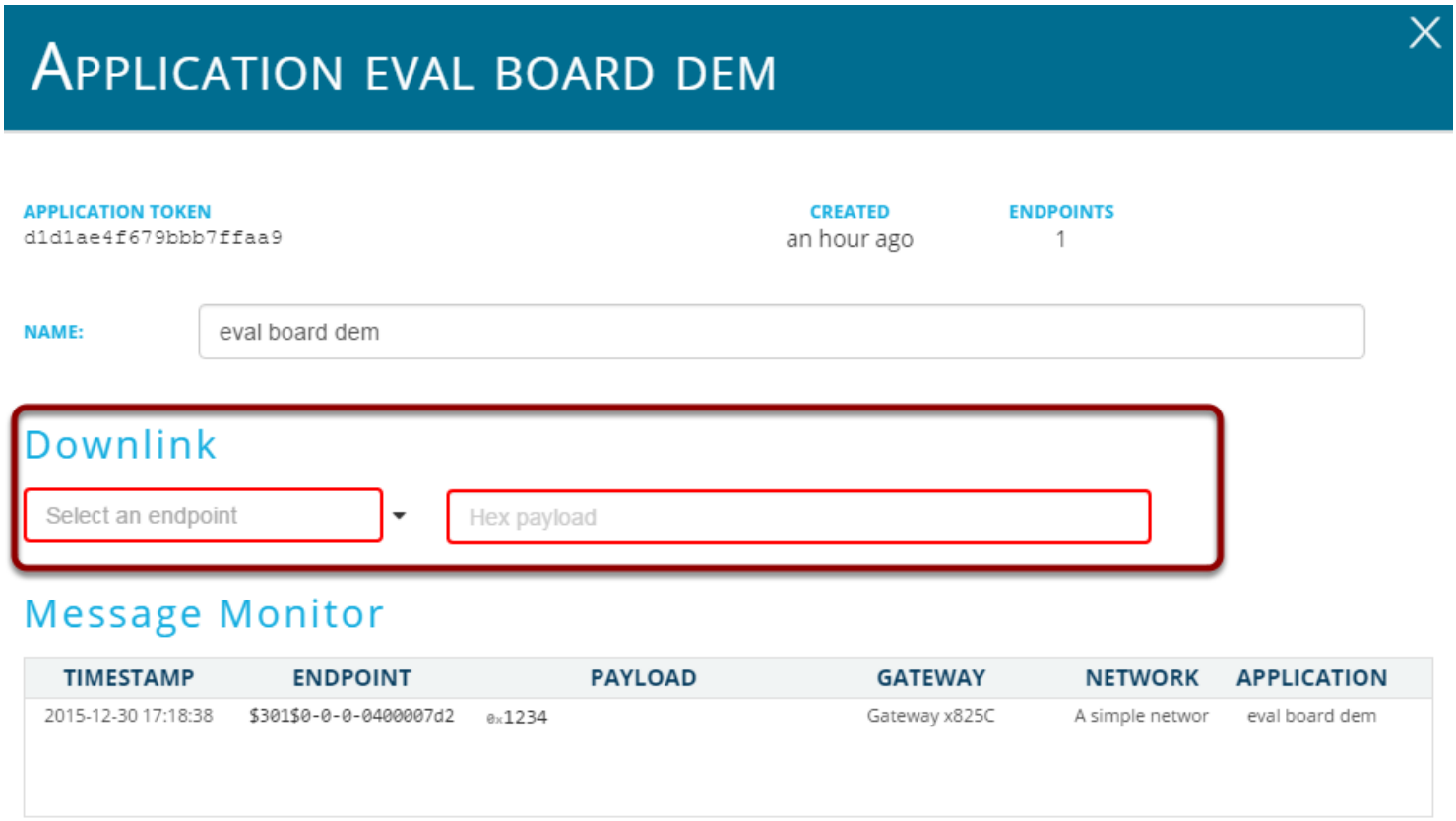
The message will post to Prelude's **Receive Window**.

Downlink using "Mailbox" mode...

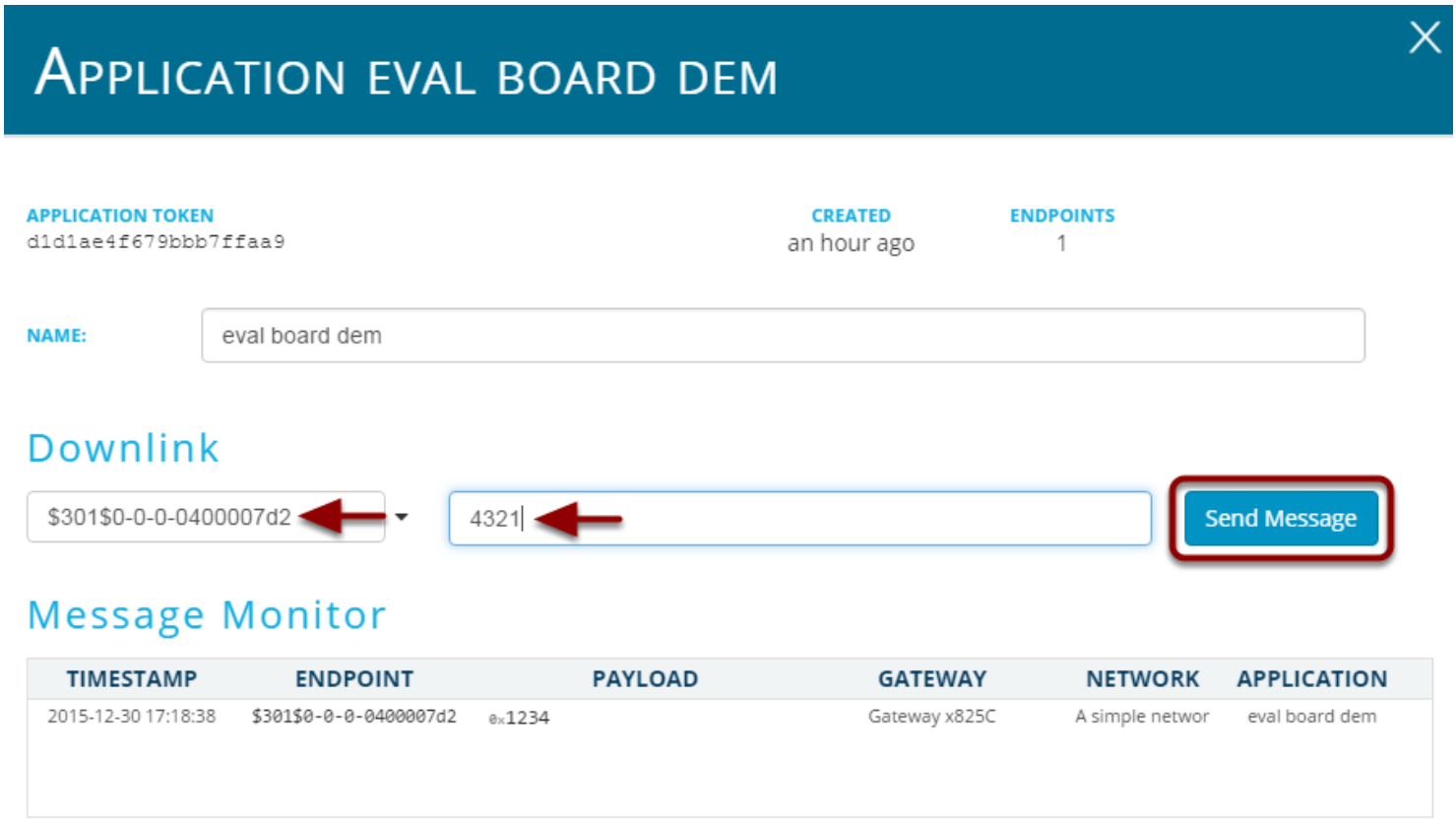
From Prelude's **Options** menu, select **Set Symphony Config**. Set the **Receive Mode** dropdown to **Mailbox**. Click **OK**.



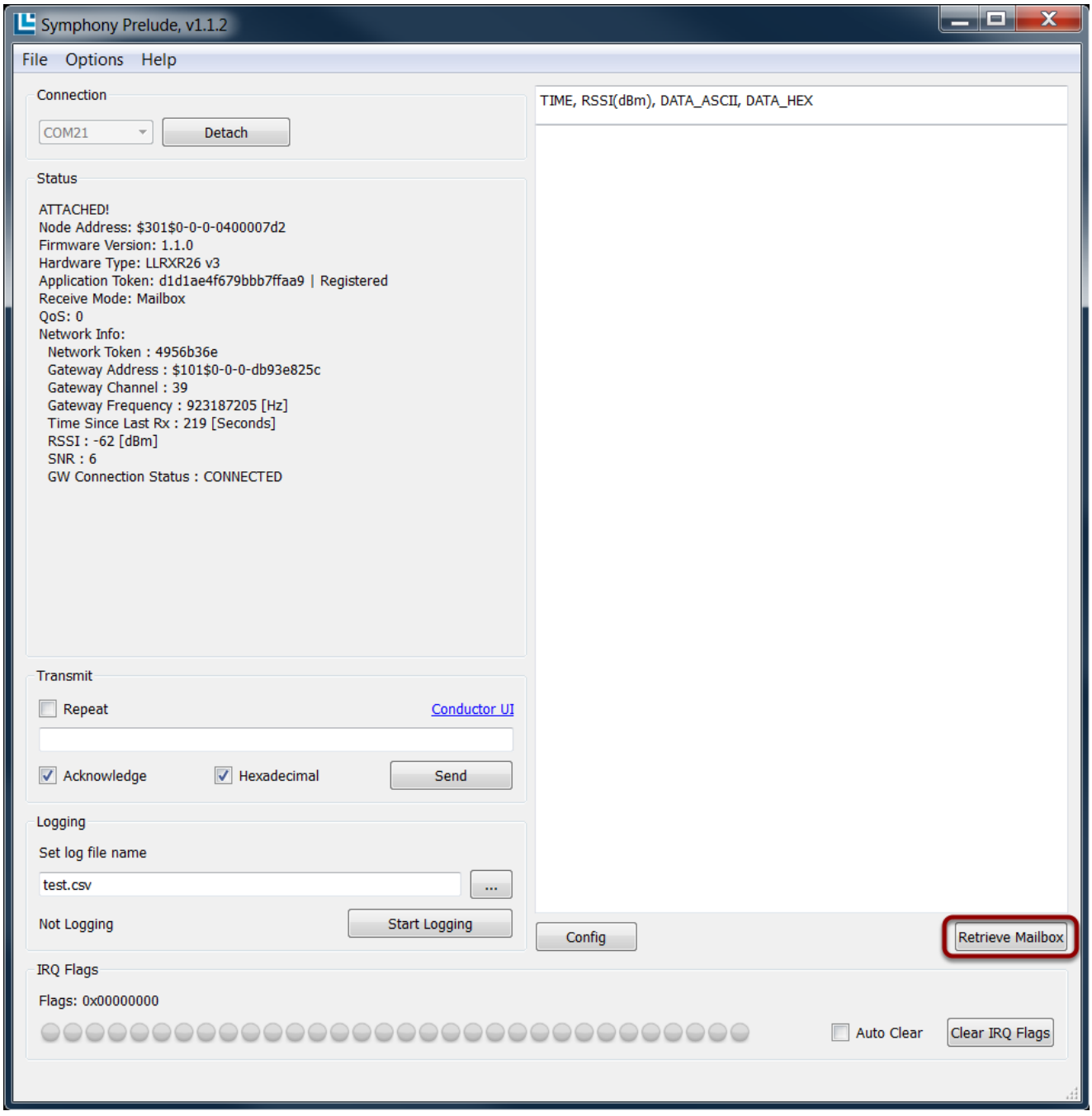
In your Conductor account, find the **Downlink** section of the "eval board demo" pop-up window.



Using the **Select an endpoint** dropdown, select the UUID of the Symphony Link Module on your evaluation board. Enter a hex-string message in the **Hex payload** editbox, like "4321". Press **Send Message**.



In Prelude, click the **Retrieve Mailbox** button.



The message will post to Prelude's **Receive Window**.