

**Wzzard™ Starter Kits**

# **HVAC Monitoring Bundle**

## **SETUP MANUAL**



**B+B SMARTWORX**  
Powered by **ADVANTECH**

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**HVAC MONITORING STARTER KIT****Kit Model BB-WSK-HAC-1**

The Wzzard™ HVAC Monitoring Application makes it simple to see the real time and historical electrical consumption of any individual machine or panel. Data can be exported to Dropbox for further analysis. Email or text message alerts can be sent when user-configured high or low limits are exceeded in critical applications.

Installation costs are kept low using the Wzzard wireless sensing platform. The platform creates a self-forming, self-healing wireless mesh network that eliminates the need for wires and requires no special skills to install. Each Wzzard sensor node is powered by long life batteries.

Using Node-RED™, a simple, browser based application preinstalled on the gateway, you can monitor current draw from any web browser on your network.

**The contents of the kit include:**

|       |                 |  |
|-------|-----------------|--|
| Qty 1 | WSD2CJA         | 2 analog-in + 2 J-Type thermocouple inputs Wzzard Node |
| Qty 2 | JC10F50-V       | 50A clamp on current sensor                            |
| Qty 2 | BB-WTJ-10-36-TT | J-Type thermocouple, #10 mounting hole, ungrounded     |
| Qty 1 | SG3000525-41    | SmartSwarm 341™ Ethernet Gateway, with Dust            |

**WZZARD NETWORK SETUP**

The Wzzard node and gateway in this kit are preconfigured. If this is the only Wzzard device in your vicinity, it will need no further configuration. If other Wzzard gateways are nearby, you will need to change the network ID on both the gateway and the node. See respective node and gateway manuals for instructions.

## DOWNLOADING THE HVAC MONITOR NODE RED FLOW TO THE GATEWAY

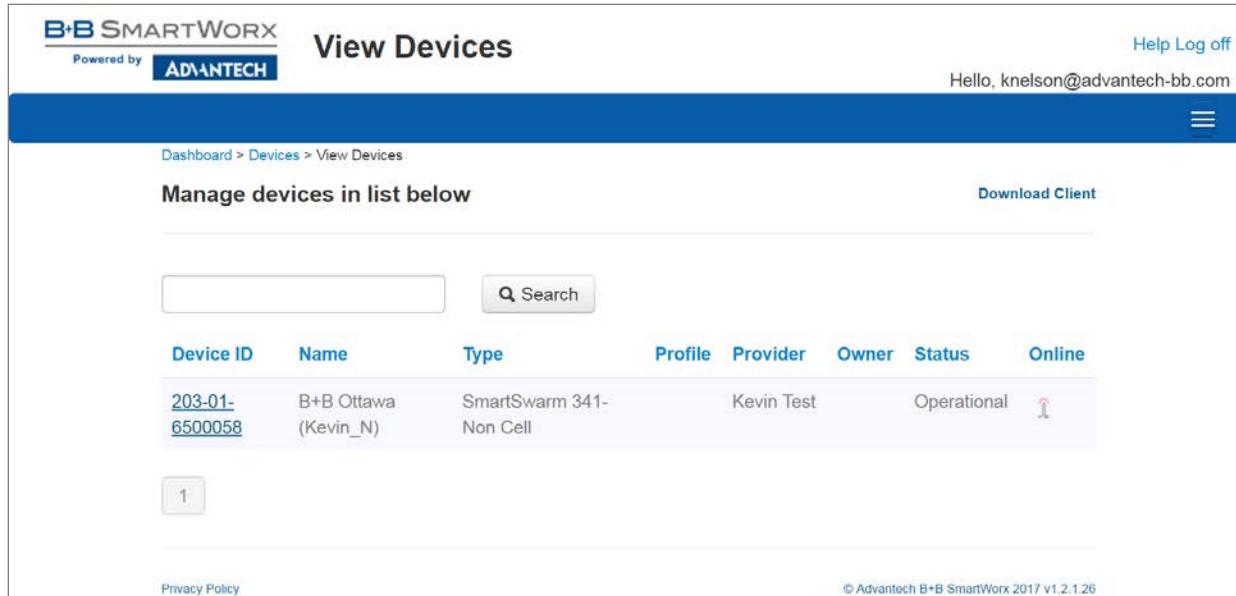
Note: router must be in operational and online state in order to add the HVAC application (ie Eth1 must be plugged in).

1. Follow the instructions in the Gateway Quick Start Guide to claim your gateway.
2. Select View Devices from the dropdown menu on the SmartWorx Hub Home Screen:



The screenshot shows the B+B SMARTWORX Home screen. The top navigation bar includes the B+B SMARTWORX logo, the text 'Powered by ADVANTECH', a 'Help Log off' link, and a greeting 'Hello, knelson@advantech-bb.com'. Below the navigation is a sidebar with the following menu items: Dashboard, Devices (with 'View Devices' highlighted in blue), Claim/Release Device, Users, Technology Providers, Configuration Profiles, Password, and Contact. The main content area is currently empty.

3. Select your device from the list of available devices:

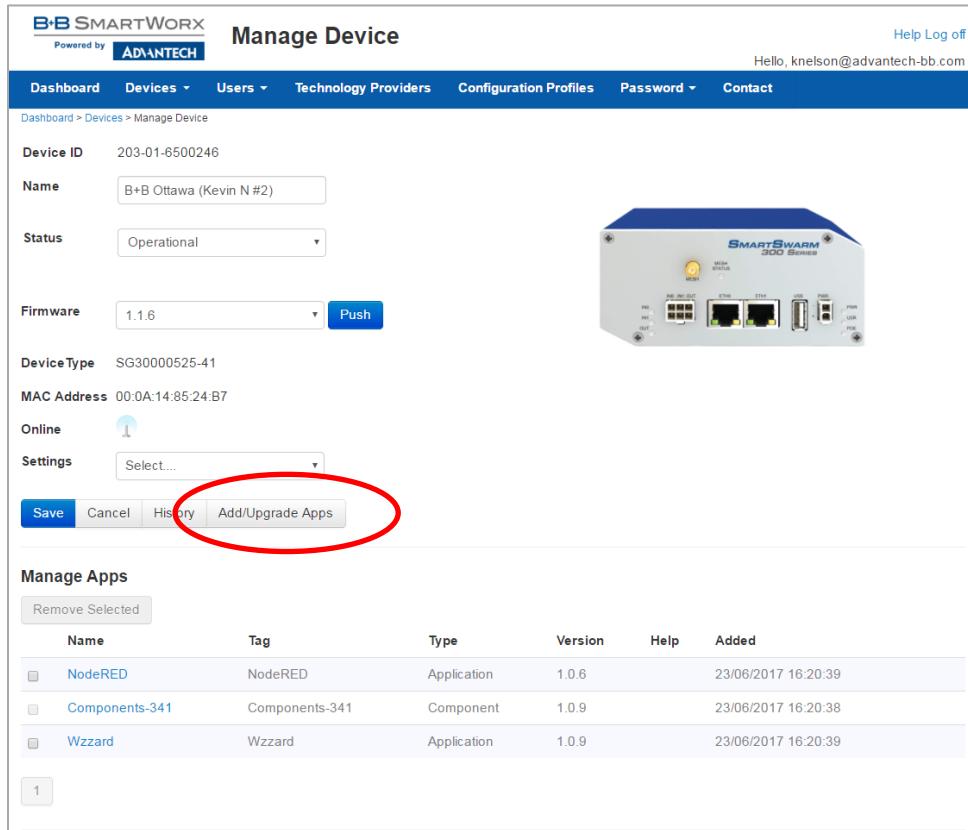


The screenshot shows the 'View Devices' screen. The top navigation bar includes the B+B SMARTWORX logo, the text 'Powered by ADVANTECH', a 'Help Log off' link, and a greeting 'Hello, knelson@advantech-bb.com'. Below the navigation is a breadcrumb trail 'Dashboard > Devices > View Devices'. The main content area has a heading 'Manage devices in list below' and a search bar. A table lists the following device information:

| Device ID      | Name                 | Type                    | Profile | Provider   | Owner | Status      | Online  |
|----------------|----------------------|-------------------------|---------|------------|-------|-------------|---|
| 203-01-6500058 | B+B Ottawa (Kevin_N) | SmartSwarm 341-Non Cell |         | Kevin Test |       | Operational |  |

At the bottom of the screen are links for 'Privacy Policy' and '© Advantech B+B SmartWorx 2017 v1.2.1.26'.

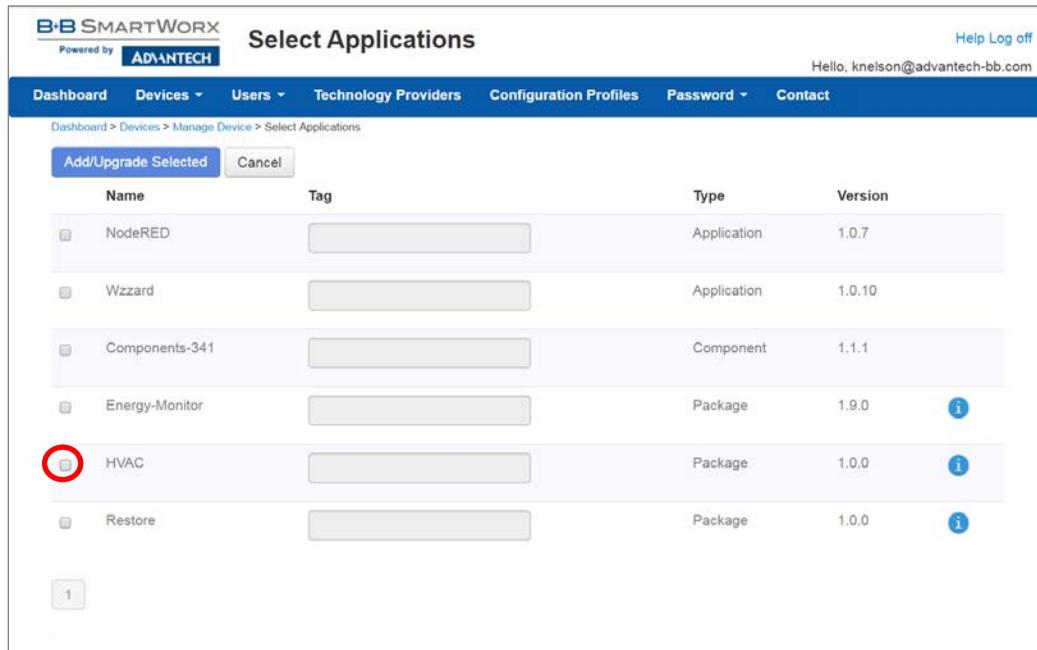
## 4. Select Add/Upgrade Apps:



The screenshot shows the 'Manage Device' page for a device with ID 203-01-6500246. The 'Manage Apps' section is visible, and the 'Add/Upgrade Apps' button is highlighted with a red circle.

| Name           | Tag            | Type        | Version | Help | Added               |
|----------------|----------------|-------------|---------|------|---------------------|
| NodeRED        | NodeRED        | Application | 1.0.6   |      | 23/06/2017 16:20:39 |
| Components-341 | Components-341 | Component   | 1.0.9   |      | 23/06/2017 16:20:38 |
| Wzzard         | Wzzard         | Application | 1.0.9   |      | 23/06/2017 16:20:39 |

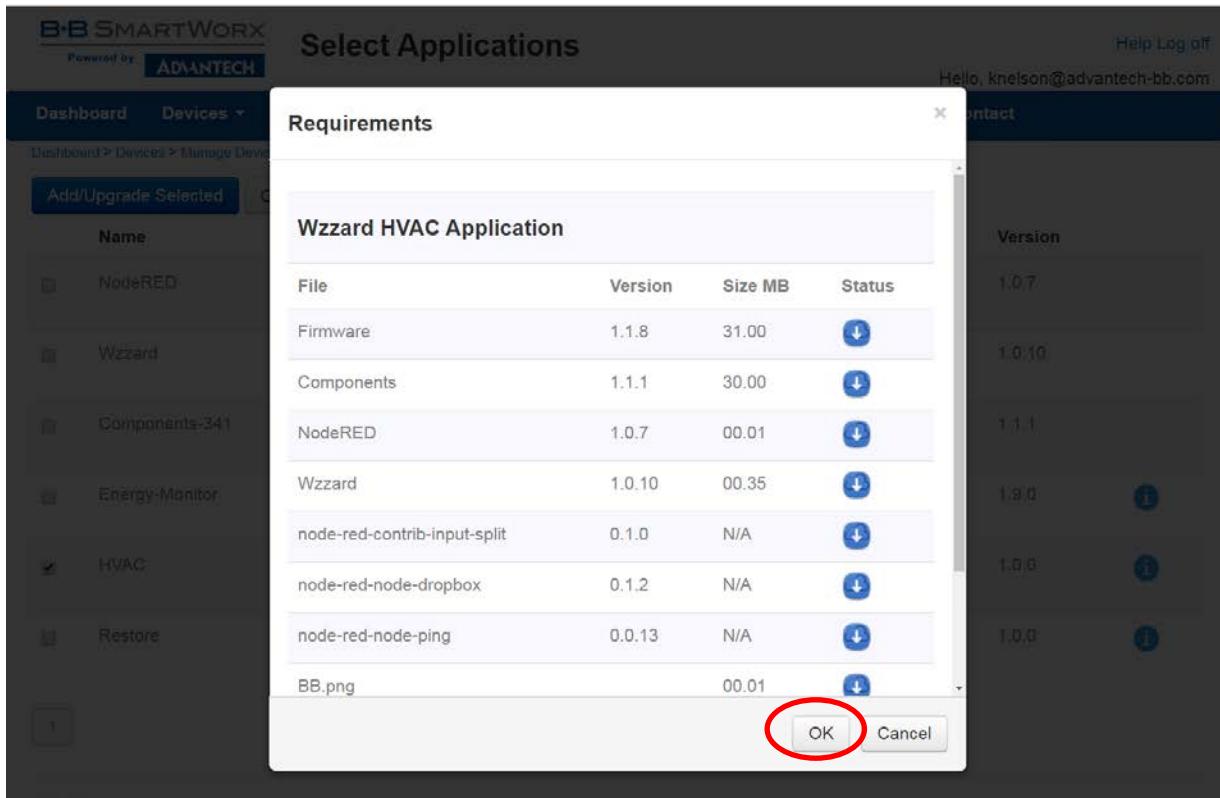
## 5. Check the box next to HVAC. A list of components to be updated will appear:



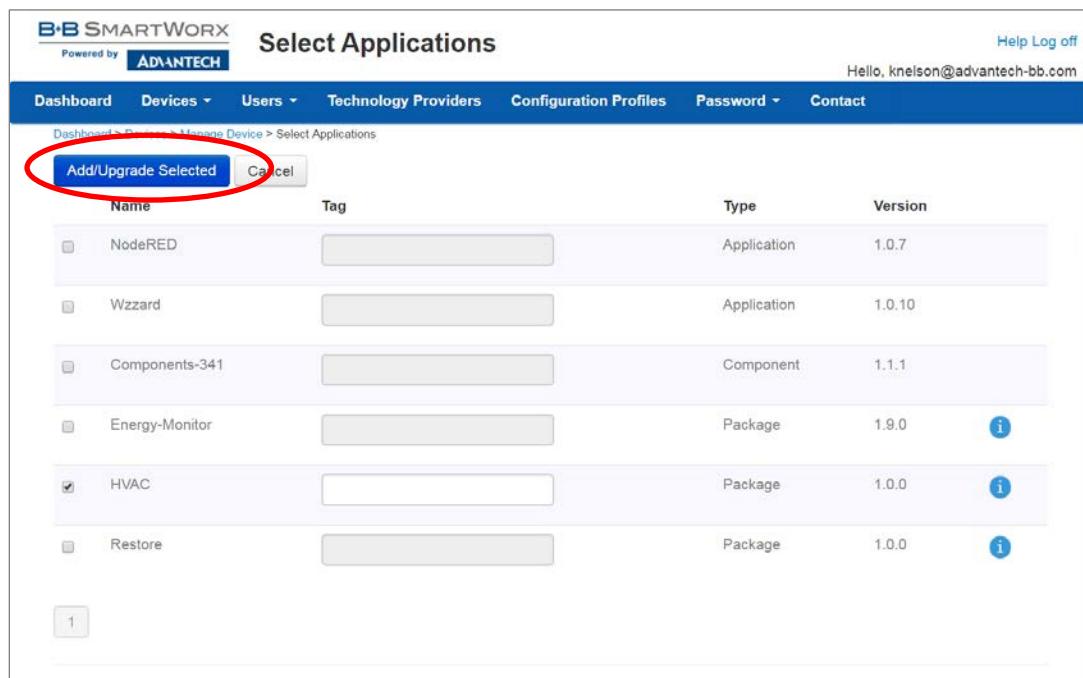
The screenshot shows the 'Select Applications' page. The 'Add/Upgrade Selected' button is visible, and the 'HVAC' checkbox is circled in red.

| Name           | Tag | Type        | Version | Help |
|----------------|-----|-------------|---------|------|
| NodeRED        |     | Application | 1.0.7   |      |
| Wzzard         |     | Application | 1.0.10  |      |
| Components-341 |     | Component   | 1.1.1   |      |
| Energy-Monitor |     | Package     | 1.9.0   |      |
| <b>HVAC</b>    |     | Package     | 1.0.0   |      |
| Restore        |     | Package     | 1.0.0   |      |

6. Click OK to accept the download:



7. Click Add/Upgrade Selected to start the download:



8. The download could take several minutes. To monitor the progress, Select History from the Manage Devices screen:

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## Manage Device

Help Log off  
Hello, knelson@advantech-bb.com

Dashboard Devices Users Technology Providers Configuration Profiles Password Contact

Dashboard > Devices > Manage Device

The apps have been queued for installation. X

Device ID: 203-01-6500058

Name: B+B Ottawa (Kevin\_N)

Status: Operational

Firmware: 1.1.8 Push

DeviceType: SG30000520-41

MAC Address: 00:0A:14:85:0D:76

Online: !

Settings: Select....

History Save Cancel Add/Upgrade Apps



9. As each component is updated, it will be marked with a ✓ check mark:

Note: "AddNode" commands will show an X if they have already been installed.

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**History**

Help Log off  
Hello, knelson@advantech-bb.com

Dashboard Devices ▾ Users ▾ Technology Providers Configuration Profiles Password ▾ Contact

Dashboard > Devices > Manage Device > History

Device Name: B+B Ottawa (Kevin N #2)  
Device ID: 203-01-6500246  
Registered On: 08/06/2017 15:01:35  
Last Check In: 16/06/2017 21:46:26

Show: 10 entries

| Command          | Created by               | Name        | Queued              | Completed             | Success | Response   |
|------------------|--------------------------|-------------|---------------------|-----------------------|---------|--|
| RestartApp       | knelson@advantech-bb.com |             | 16/06/2017 21:46:37 | 6/16/2017 10:02:13 PM | ✓       |  |
| AddFlow          | knelson@advantech-bb.com | HVAC        | 16/06/2017 21:46:37 | 6/16/2017 10:02:07 PM | ✗       | No valid HTTP response. The process may still be in progress, please check your Palette. |
| GetFlow          | knelson@advantech-bb.com | HVAC        | 16/06/2017 21:46:37 | 6/16/2017 10:02:05 PM | ✓       |  |
| InstallNewApp    | knelson@advantech-bb.com | HVAC        | 16/06/2017 21:46:37 | 16/06/2017 21:46:37   | ✓       | Completed  |
| GetBinaryFile    | knelson@advantech-bb.com |             | 16/06/2017 21:46:37 | 6/16/2017 10:01:59 PM | ✓       |  |
| AddNode          | knelson@advantech-bb.com |             | 16/06/2017 21:46:37 | 6/16/2017 10:01:57 PM | ✗       | No valid HTTP response. The process may still be in progress, please check your Palette. |
| AddNode          | knelson@advantech-bb.com |             | 16/06/2017 21:46:37 | 6/16/2017 10:01:55 PM | ✗       | No valid HTTP response. The process may still be in progress, please check your Palette. |
| AddNode          | knelson@advantech-bb.com |             | 16/06/2017 21:46:37 | 6/16/2017 10:01:54 PM | ✗       | No valid HTTP response. The process may still be in progress, please check your Palette. |
| DownloadSettings | knelson@advantech-bb.com | IoT Gateway | 16/06/2017 21:46:37 | 6/16/2017 10:01:52 PM | ✓       |  |
| InstallNewApp    | knelson@advantech-bb.com | Wzzard      | 16/06/2017 21:46:37 | 6/16/2017 10:01:50 PM | ✓       |  |

Showing 1 to 10 of 49 entries

## POWER UP WZZARD EDGE NODE

1. Loosen the (4) black screws that hold the top of the node in place.
2. Install your batteries.
3. Note: Use (2) 3.6V 2400 mAH Lithium Thionyl Chloride AA batteries.
4. Install the battery clip.
5. Replace the cover. Tighten the (4) top screws to maintain IP67 rating. Torque each screw to 5 to 8 in-lb (0.6 to 0.9 Nm). This is equivalent to 1/4 to 1/2 turn after screw makes contact.
6. Check LED.

After you have installed the batteries, the LED will begin to blink. This indicates that the Node is attempting to establish a network connection. The LED will cease blinking when a connection is made.

|      | LED Indicator                 | Status  |
|------|-------------------------------|---|
| Data | Solid ON                      | Module startup initialization (approx. 10 seconds)            |
|      | Slow Blink<br>(1 per second)  | Attempting to establish connection with SmartMesh IP network. |
|      | Fast Blink<br>(10 per second) | Firmware update in progress.                                  |
|      | OFF                           | Unit is connected to wireless network.                        |

1. Attach the External Antenna.



**Note:** The best way to remove the clip is to insert a small flathead screwdriver between the batteries and the clip, parallel to the batteries, and give the screwdriver a gentle twist. This will remove the clip without damage.

## ACCESS Node-RED UI IN THE GATEWAY

1. Attach the antenna to the Wzzard™ antenna port on the gateway.
2. Attach the Ethernet cable to the ETH0 port on the gateway and the other end to your PC. You will use an Ethernet connection to configure the gateway and to communicate with it.
3. Attach the supplied power supply and plug it in.
4. Open a browser on your computer and open the Node-RED™ configuration page. The default address is: **192.168.1.1:1880/ui**. (Chrome or Firefox recommended.)

The screenshot shows the 'Configuration' section of the Wzzard Node Info page. It displays the following information:

- BTLE ID:** 0013430F22D5
- MESH ID:** 00170D000058D63B
- Serial No:** BB0338167015
- Hardware Version:** 6
- Model Type:** WSD2CJA
- Firmware:** 1.6.3
- Battery Install Date:** 2017-06-08
- Manufacture Date:** 2017-05-05

**Select Cellular Carrier Info for Text and Email alerts**

Alert configuration for various parameters:

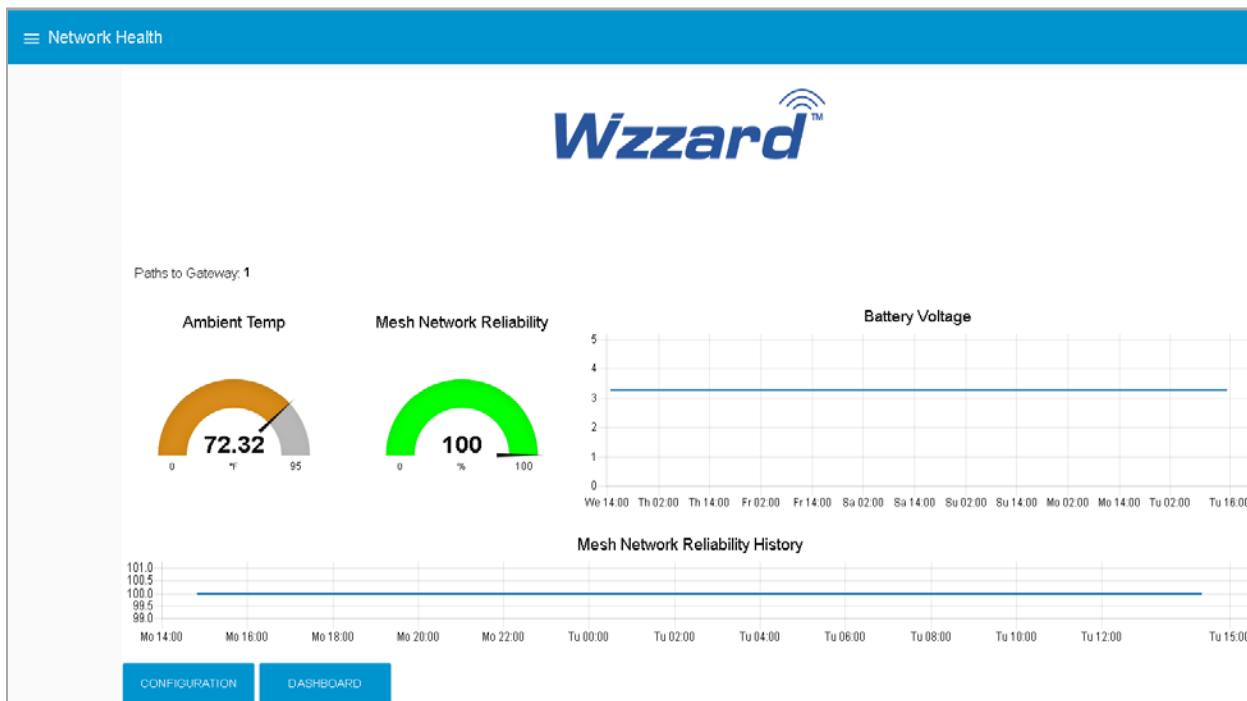
- Enable Alerts for Air Temp In: Air Temp In Upper Alert, Air Temp In Lower Alert
- Enable Alerts for Air Temp Out: Air Temp Out Upper Alert, Air Temp Out Lower Alert
- Enable Alerts for Compressor Current: Compressor Current Upper Alert, Compressor Current Lower Alert
- Enable Alerts for Fan Current: Fan Current Upper Alert, Fan Current Lower Alert
- Enable Absolute Temp Differential Alert: Absolute Temperature Differential Under

At the bottom are buttons for **NETWORK HEALTH** and **DASHBOARD**.

5. The Wzzard Node information values will populate when the node joins the network.
6. You can set up a phone number to receive text messages and/or an e-mail address for receiving alerts on this page. For text messaging, you will need to select the cell carrier of the receiving phone. If the carrier is not on the list, select custom, and add the URL of the carrier text addresses. If your carrier is not listed, contact your carrier for the address of their SMS gateway.
7. You can enable or disable alerts as well as setting the trigger values on this page also.

## NETWORK HEALTH PAGE

1. Click the “Network Health” button on the lower left corner of the Configuration page. The page below appears. This page shows the status of the network.

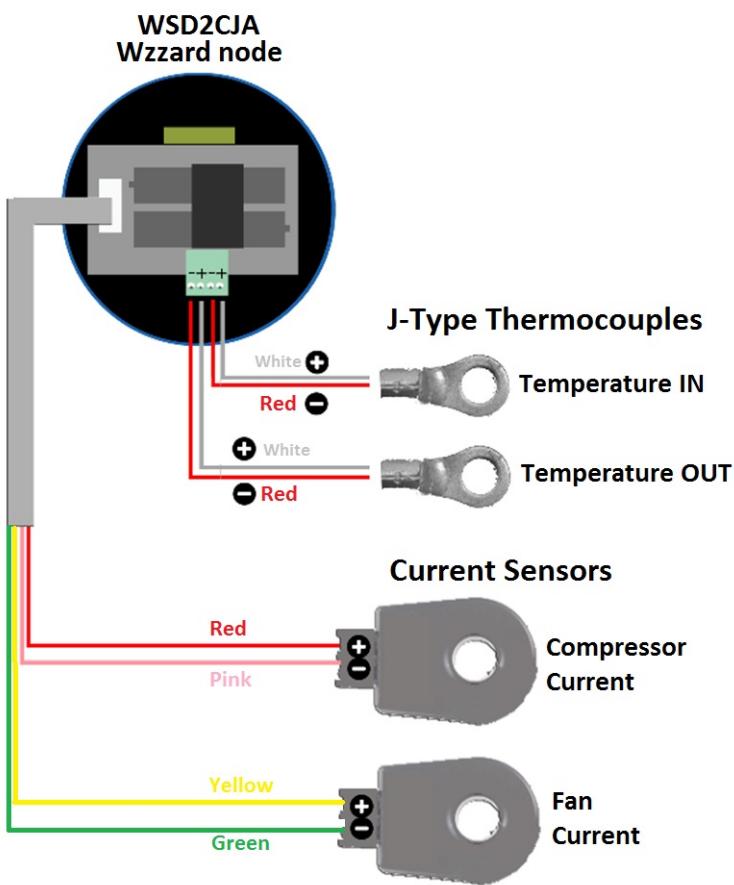


## ATTACHING THE SENSORS ON THE INTELLIGENT EDGE NODES

## 1. Wire Your Sensors to the Edge Node.

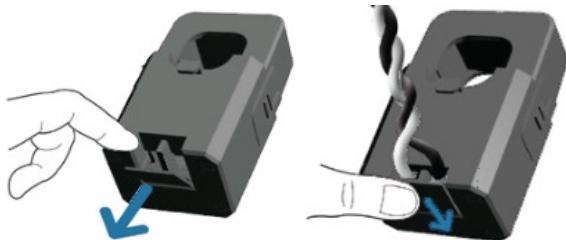
The Wzzard™ HVAC monitoring kit comes with two AC current sensors and two J-Type Thermocouples.

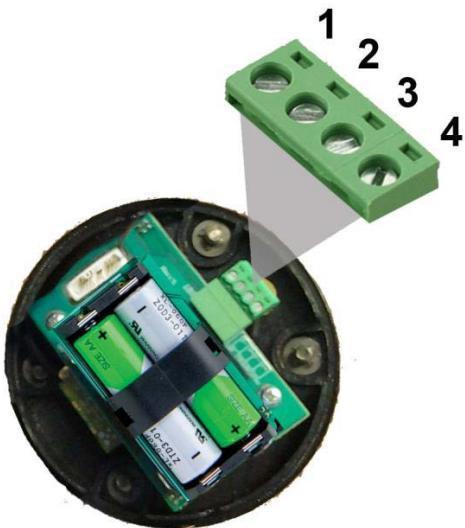
| Sensor             | Wzzard Industrial Node with S&T cable | Connection |
|--------------------|---------------------------------------|------------|
| Compressor Current | Sensor (+) to Stripped & Tinned Cable | RED        |
|                    | Sensor (-) to Stripped & Tinned Cable | PINK       |
| Fan Current        | Sensor (+) to Stripped & Tinned Cable | YELLOW     |
|                    | Sensor (-) to Stripped & Tinned Cable | GREEN      |
| Temp In            | Sensor (+) to Internal Terminal Block | 1          |
|                    | Sensor (-) to Internal Terminal Block | 2          |
| Temp Out           | Sensor (+) to Internal Terminal Block | 3          |
|                    | Sensor (-) to Internal Terminal Block | 4          |



#### Current Sensors

- Open the wire protector clamp by pushing it away from the sensor body.
- Attach your wires.
- Close the wire protector clamp.



Temperature Sensors

- 1 = Thermocouple input #1 positive (+)
- 2 = Thermocouple input #1 negative (-)
- 3 = Thermocouple input #2 positive (+)
- 4 = Thermocouple input #2 negative (-)

**2. Mount Your Sensors.**Current Sensors

The sensor can be mounted in any position.

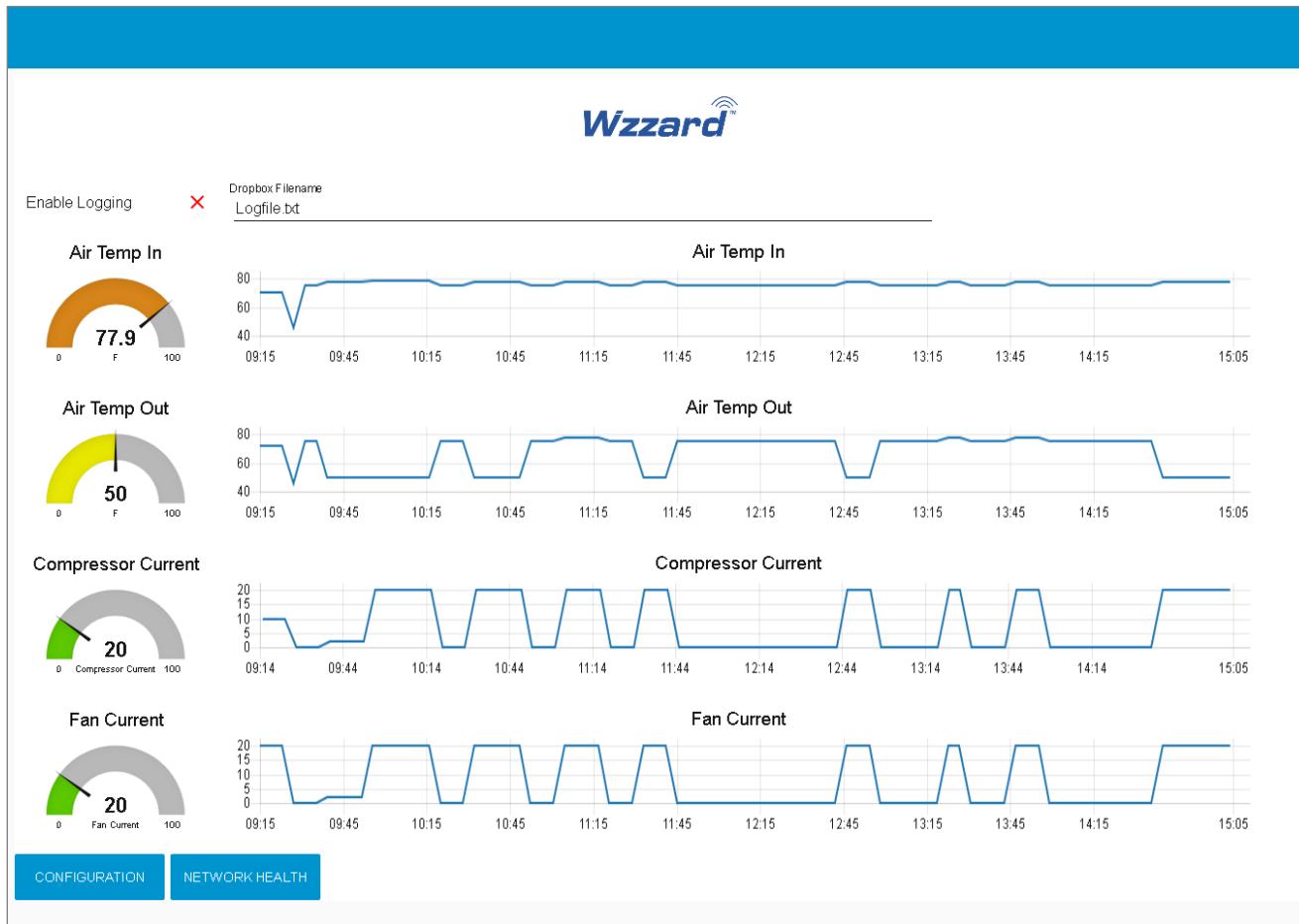
Open the clamp release by pushing it away from the sensor body. Run the wire you are monitoring through the opening in the sensor.



Close the sensor firmly around your wire and ensure that the clamp release has snapped back into place.

## ACCESSING THE DASHBOARD

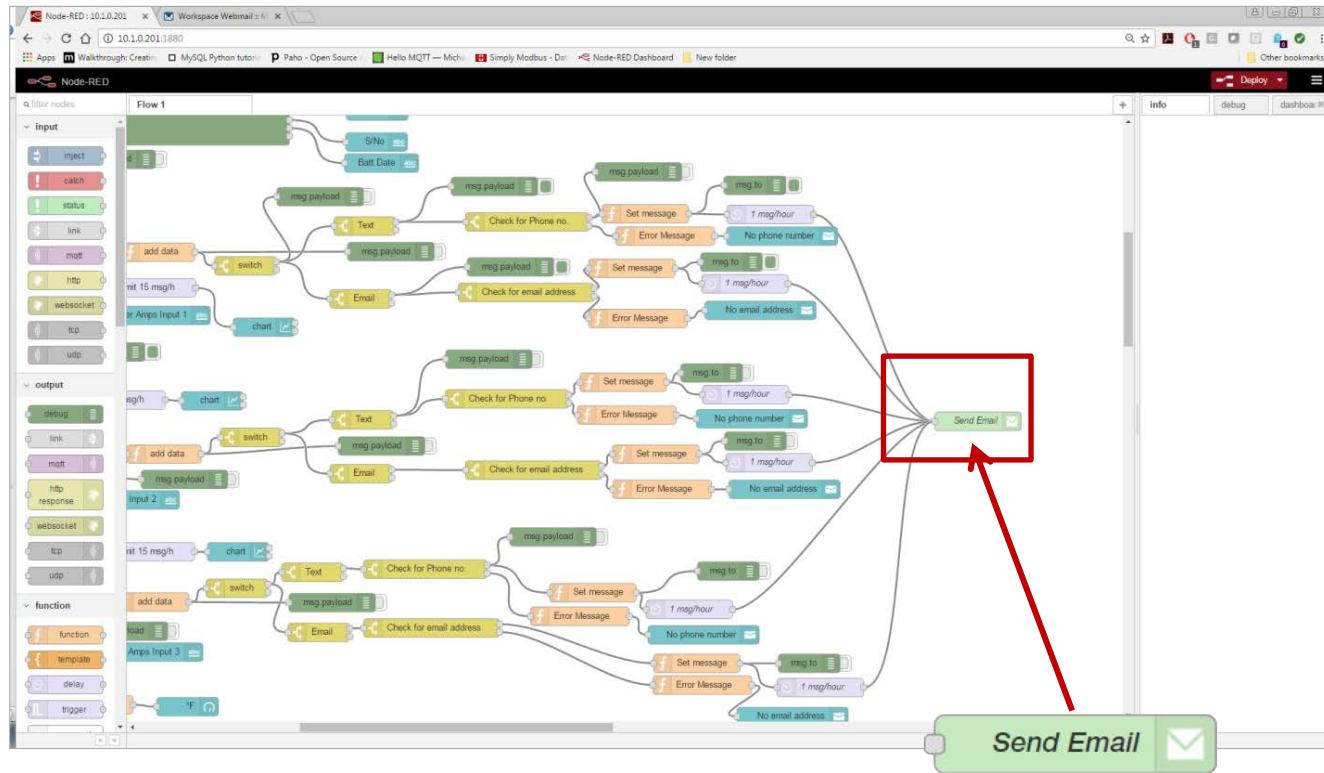
1. Open a browser on your computer and open the Node-RED™ configuration page. The default address is: **192.168.1.1:1880/ui**
2. Click on the “Dashboard” button on the lower left corner of the configuration page.
3. The dashboard should look like the following screen.



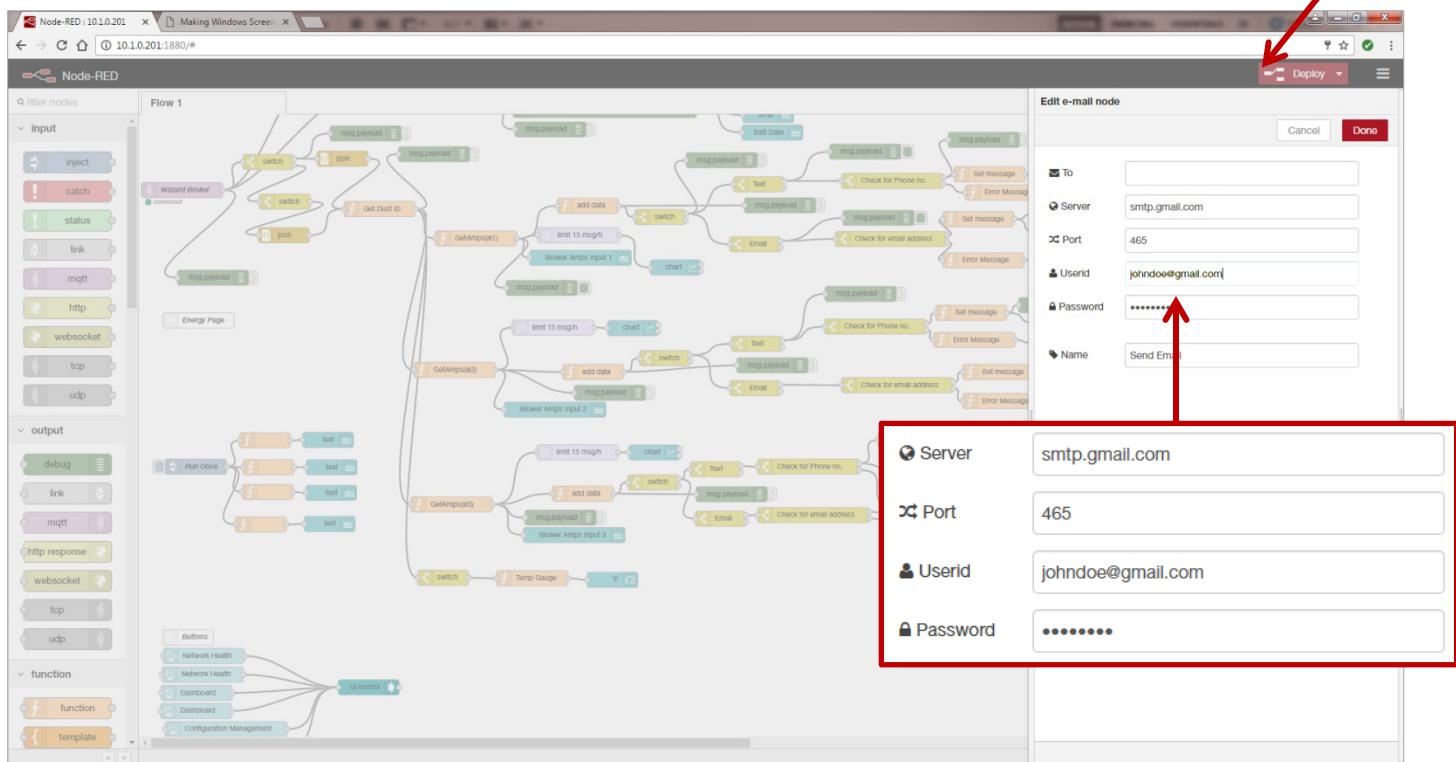
4. You can switch to the Configuration page or Network Health page by clicking on their respective buttons on the lower left.

## SETTING UP AN E-MAIL ACCOUNT

1. From your browser, open the Node-RED™ flow at 192.168.1.1:1880.

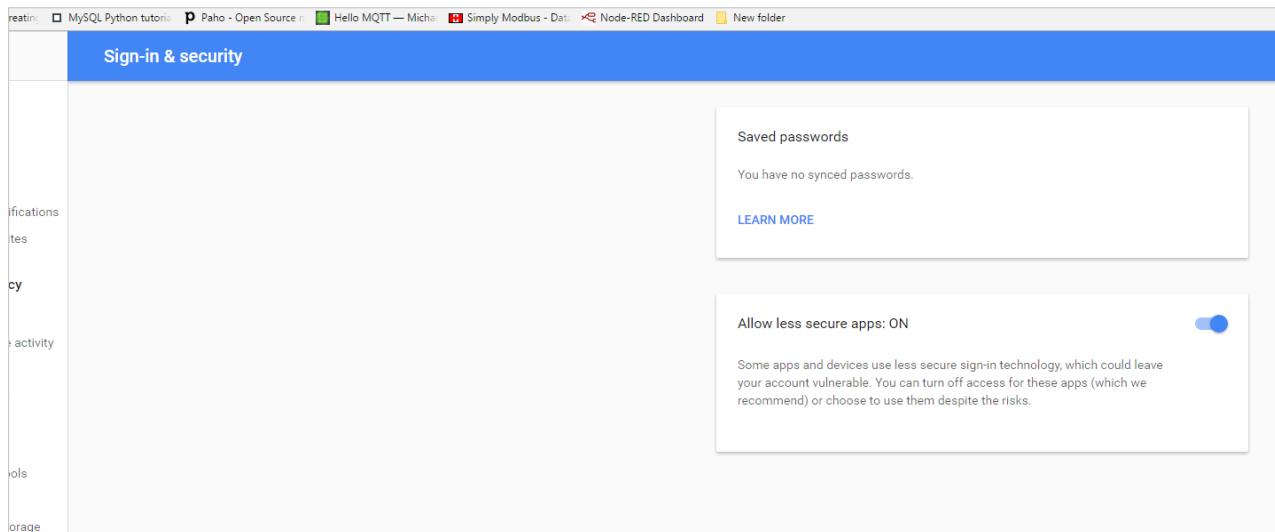


2. Locate “Energy Page”, then scroll right and locate the green “Send Email” node; double click on it.



3. Enter your UserID and Password for your e-mail server in the appropriate boxes. (Leave the “To” field blank.)

Note: If you are using a G-Mail account, you will need to enable “Less Secure Apps” in the Google security settings. See below.

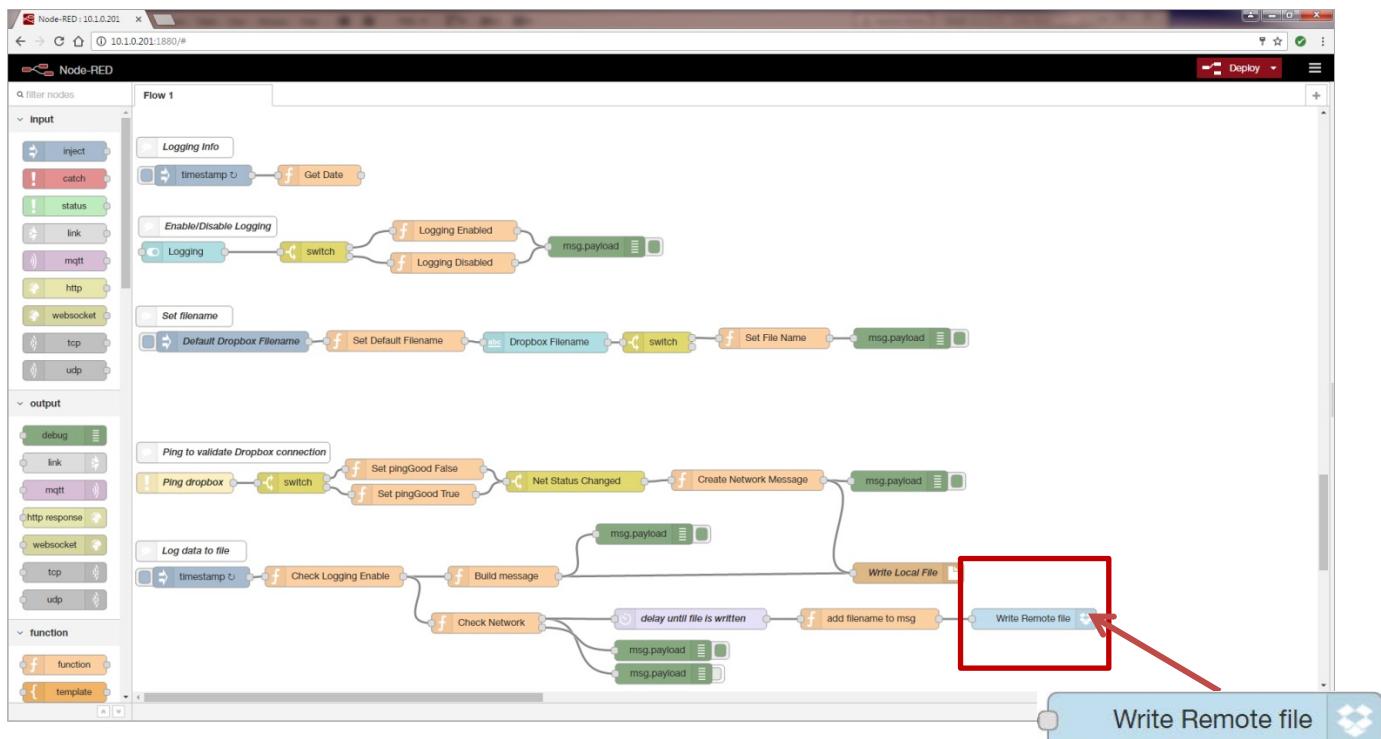


4. Click “Done”. Then Click the “Deploy” button in the upper right corner of the page.

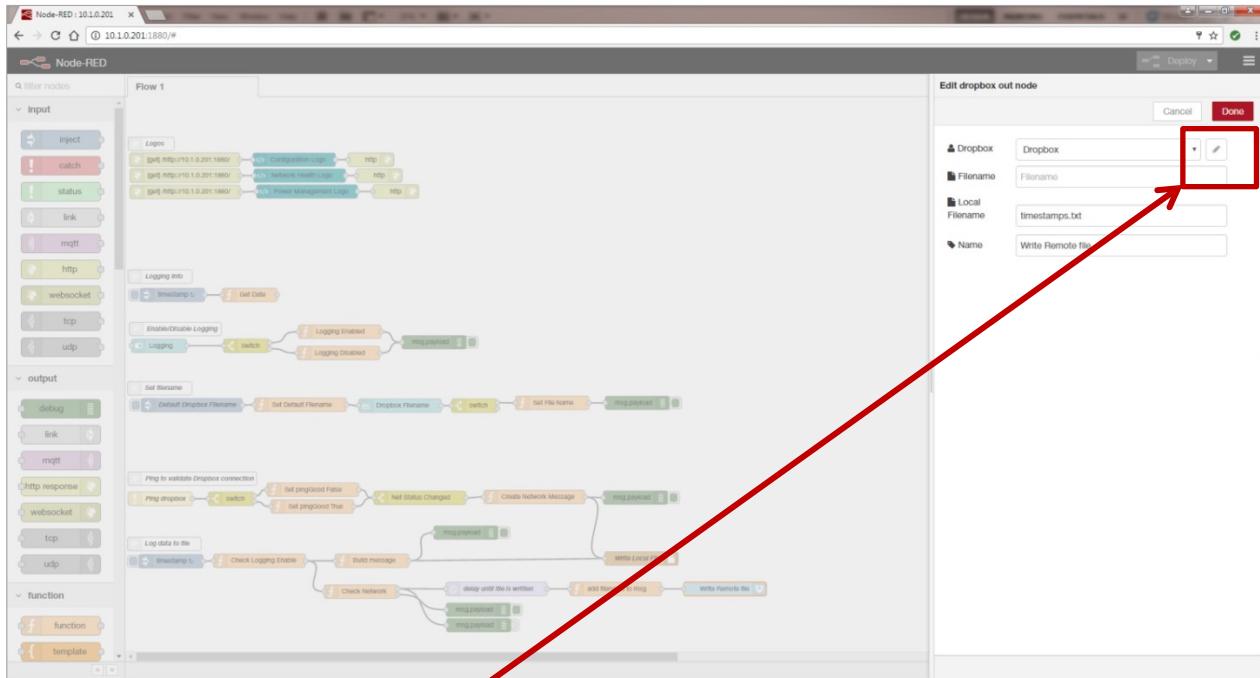
## SETTING UP YOUR DROPBOX FOR LOGGING

1. Log in to your Dropbox account or sign up for a new one.
2. Once signed up or logged in:
  - Go to <https://www.dropbox.com/developers>
  - Click 'Create your app' box in the center of the screen.
  - Select 'Dropbox API app'.
  - Choose an appropriate answer as to whether your node should be limited to its own folder or given full access. (TIP: This can be changed later, so choose 'Yes' to restrict the application while testing might be a good idea.)
  - Choose an app name.
  - Click 'Create app'.

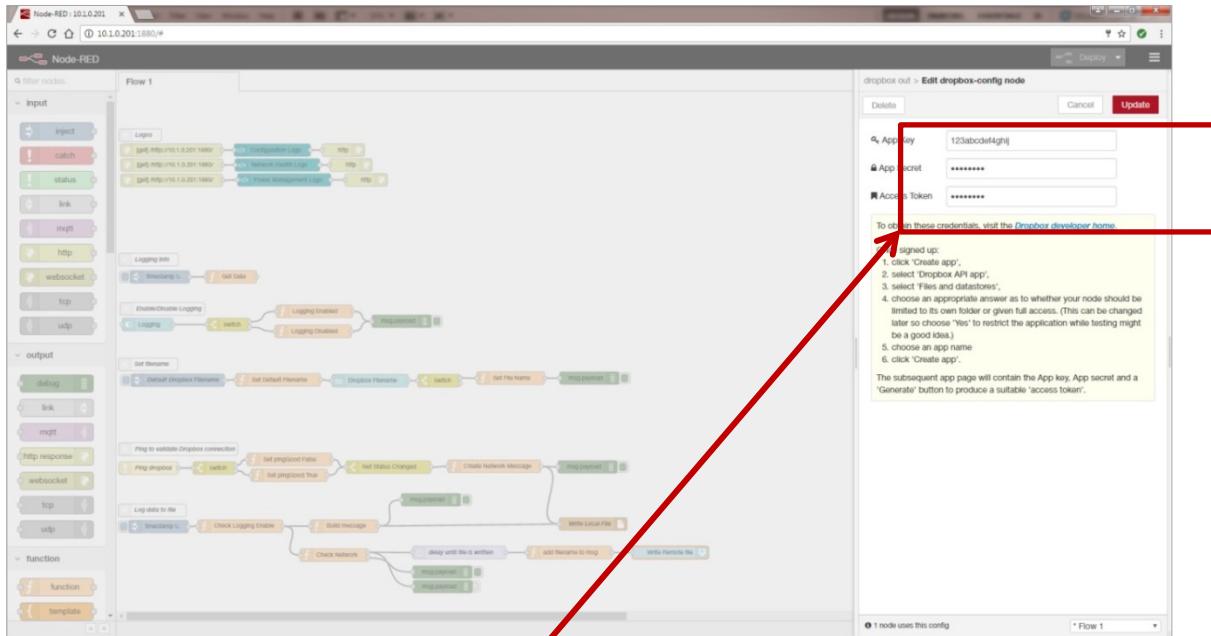
The subsequent app page will contain the App Key, App Secret and a 'Generate' button to produce a suitable 'access token'. Save these strings so you can enter them into the application later.
3. From your browser, open the Node-RED™ flow at **192.168.1.1:1880**.



4. Locate "Log data to file", then scroll right and locate the blue 'Write Remote File' node; double click on it.



5. Then click on the pencil icon next to the Dropbox text window.



6. Fill in the App Key, App Secret, and Access Token you got from Dropbox in their respective fields. (See yellow box for more information.)

7. Click Updated; then Done again to close both windows.

8. Click the “Deploy” button in the upper right corner of the page.

9. Enable logging on the Dashboard web page.

## APPENDIX A. CARRIER TEXT MESSAGING URL ADDRESSES

| U.S.A Carriers                 |  |
|--------------------------------|--|
| Alltel                         | [10-digit phone number]@message.alltel.com<br>Example: 1234567890@message.alltel.com                             |
| AT&T (formerly Cingular)       | [10-digit phone number]@txt.att.net<br>[10-digit phone number]@cingularme.com<br>Example: 1234567890@txt.att.net |
| Boost Mobile                   | [10-digit phone number]@myboostmobile.com<br>Example: 1234567890@myboostmobile.com                               |
| Nextel (now Sprint Nextel)     | [10-digit telephone number]@messaging.nextel.com<br>Example: 1234567890@messaging.nextel.com                     |
| Sprint PCS (now Sprint Nextel) | [10-digit phone number]@messaging.sprintpcs.com<br>Example: 1234567890@messaging.sprintpcs.com                   |
| T-Mobile                       | [10-digit phone number]@tmomail.net<br>Example: 1234567890@tmomail.net   |
| US Cellular                    | [10-digit phone number]@email.uscc.net (SMS)<br>Example: 1234567890@email.uscc.net                               |
| Verizon                        | [10-digit phone number]@vtext.com<br>Example: 1234567890@vtext.com   |
| Virgin Mobile USA              | [10-digit phone number]@vmobl.com<br>Example: 1234567890@vmobl.com   |

| International Carriers               | Email to SMS Gateway           |
|--------------------------------------|--------------------------------|
| 7-11 Speakout (USA GSM)              | number@cingularme.com          |
| Airtel (Karnataka, India)            | number@airtelkk.com            |
| Airtel Wireless (Montana, USA)       | number@sms.airtelmontana.com   |
| Alaska Communications Systems        | number@msg.acsalaska.com       |
| Aql                                  | number@text.aql.com            |
| AT&T Enterprise Paging               | number@page.att.net            |
| BigRedGiant Mobile Solutions         | number@tachyonsms.co.uk        |
| Bell Mobility & Solo Mobile (Canada) | number@txt.bell.ca             |
| BPL Mobile (Mumbai, India)           | number@bplmobile.com           |
| Cellular One (Dobson)                | number@mobile.celloneusa.com   |
| Cingular (Postpaid)                  | number@cingularme.com          |
| Centennial Wireless                  | number@cwemail.com             |
| Cingular (GoPhone prepaid)           | number@cingularme.com (SMS)    |
| Claro (Brasil)                       | number@clarotorpedo.com.br     |
| Claro (Nicaragua)                    | number@ideasclaro-ca.com       |
| Comcel                               | number@comcel.com.co           |
| Cricket                              | number@sms.mycricket.com (SMS) |
| CTI                                  | number@sms.ctimovil.com.ar     |
| Emtel (Mauritius)                    | number@emtelworld.net          |
| Fido (Canada)                        | number@fido.ca                 |
| General Communications Inc.          | number@msg.gci.net             |

|                                    |                                       |
|------------------------------------|---------------------------------------|
| <b>Globalstar (satellite)</b>      | <i>number@msg.globalstarusa.com</i>   |
| <b>Helio</b>                       | <i>number@messaging.sprintpcs.com</i> |
| <b>Illinois Valley Cellular</b>    | <i>number@ivctext.com</i>             |
| <b>Iridium (satellite)</b>         | <i>number@msg.iridium.com</i>         |
| <b>Iusacell</b>                    | <i>number@rek2.com.mx</i>             |
| <b>i wireless</b>                  | <i>number.iws@iwpes.net</i>           |
| <b>Koodo Mobile (Canada)</b>       | <i>number@msg.koodomobile.com</i>     |
| <b>LMT (Latvia)</b>                | <i>number@sms.lmt.lv</i>              |
| <b>Meteor (Ireland)</b>            | <i>number@sms.mymeteor.ie</i>         |
| <b>Mero Mobile (Nepal)</b>         | <i>977number@sms.spicenepal.com</i>   |
| <b>MetroPCS</b>                    | <i>number@mymetropcs.com</i>          |
| <b>Movicom (Argentina)</b>         | <i>number@sms.movistar.net.ar</i>     |
| <b>Mobitel (Sri Lanka)</b>         | <i>number@sms.mobitel.lk</i>          |
| <b>Movistar (Colombia)</b>         | <i>number@movistar.com.co</i>         |
| <b>MTN (South Africa)</b>          | <i>number@sms.co.za</i>               |
| <b>MTS (Canada)</b>                | <i>number@text.mtsmobility.com</i>    |
| <b>Nextel (United States)</b>      | <i>number@messaging.nextel.com</i>    |
| <b>Nextel (Argentina)</b>          | <i>TwoWay.11number@nextel.net.ar</i>  |
| <b>Orange Polska (Poland)</b>      | <i>9digit@orange.pl</i>               |
| <b>Personal (Argentina)</b>        | <i>number@alertas.personal.com.ar</i> |
| <b>Plus GSM (Poland)</b>           | <i>+48number@text.plusgsm.pl</i>      |
| <b>President's Choice (Canada)</b> | <i>number@txt.bell.ca</i>             |
| <b>Qwest</b>                       | <i>number@qwestmp.com</i>             |
| <b>Rogers (Canada)</b>             | <i>number@pcs.rogers.com</i>          |
| <b>SL Interactive (Australia)</b>  | <i>number@slinteractive.com.au</i>    |
| <b>Sasktel (Canada)</b>            | <i>number@sms.sasktel.com</i>         |
| <b>Setar Mobile email (Aruba)</b>  | <i>297+number@mas.aw</i>              |
| <b>Suncom</b>                      | <i>number@tms.suncom.com</i>          |
| <b>T-Mobile (Austria)</b>          | <i>number@sms.t-mobile.at</i>         |
| <b>T-Mobile (UK)</b>               | <i>number@t-mobile.uk.net</i>         |
| <b>Telus Mobility (Canada)</b>     | <i>number@msg.telus.com</i>           |
| <b>Thumb Cellular</b>              | <i>number@sms.thumbcellular.com</i>   |
| <b>Tigo (Formerly Ola)</b>         | <i>number@sms.tigo.com.co</i>         |
| <b>Tracfone (prepaid)</b>          | <i>number@mmst5.tracfone.com</i>      |
| <b>Unicel</b>                      | <i>number@utext.com</i>               |
| <b>Virgin Mobile (Canada)</b>      | <i>number@vmobile.ca</i>              |
| <b>Vodacom (South Africa)</b>      | <i>number@voda.co.za</i>              |
| <b>Vodafone (Italy)</b>            | <i>number@sms.vodafone.it</i>         |
| <b>YCC</b>                         | <i>number@sms.ycc.ru</i>              |
| <b>MobiPCS (Hawaii only)</b>       | <i>number@mobipcs.net</i>             |

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