

# Wzzard™ Mesh Gen2 Starter Bundles

## HVAC Monitoring Kit

### SETUP MANUAL



**B+B SMARTWORX**

Powered by

**ADVANTECH**

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**HVAC MONITORING STARTER KIT****Kit Model BB-WSK-HAC-2**

The Wzzard™ HVAC Monitoring Application provides a non-intrusive, easily installed solution for monitoring current and differential temperature on your HVAC equipment without disrupting your existing facility operations. 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	BB-WSD2C21150	2 analog-in + 2 J-Type thermocouple inputs Wzzard Node
Qty 2	BB-JC10F50-V	50A clamp on current sensor
Qty 2	BB-WTJ-10-36-TT	J-Type thermocouple, #10 mounting hole, ungrounded
Qty 1	SmartSwarm 342™	Ethernet Wzzard Mesh Gateway

**WZZARD MESH NETWORK SETUP**

The Wzzard Mesh Node and Gateway in this kit are preconfigured. If this is the only Wzzard Mesh device in your vicinity, it will need no further configuration. If other Wzzard Mesh gateways or nodes are nearby and unclaimed you will need to claim the gateway and the node. See respective node and gateway manuals for instructions.

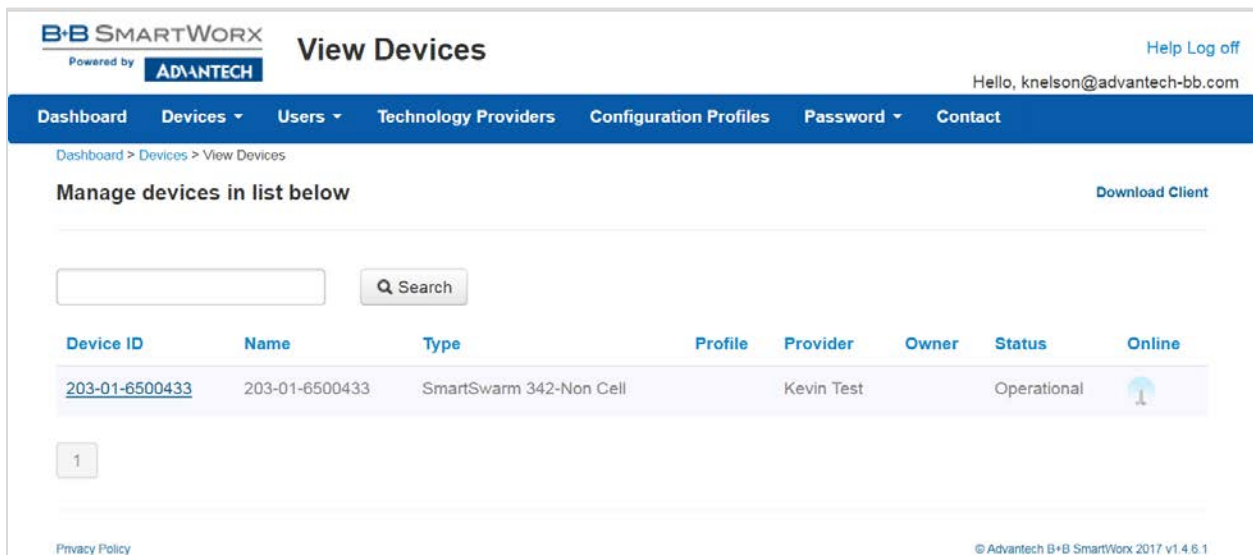
## DOWNLOADING THE HVAC MONITOR NODE-RED™ FLOW TO THE GATEWAY

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.



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



4. Select **Add/Upgrade Apps**.

**B+B SMARTWORX** Manage Device Help Log off  
Hello, knelson@advantech-bb.com

Dashboard Devices Users Technology Providers Configuration Profiles Password Contact

Dashboard > Devices > Manage Device

Device ID: 203-01-6500433

Name:

Status:

Firmware:

Device Type: SG30000525-42

MAC Address: 00:0A:14:86:77:C6


Online:

Settings:

**Manage Apps**

	Name	Tag	Type	Version	Help	Added
<input type="checkbox"/>	Wzzard Mesh	Wzzard Mesh	Application	1.0.6		29/03/2018 17:55:17
<input type="checkbox"/>	Components-342	Components-342	Component	1.4.0		29/03/2018 17:55:17

1



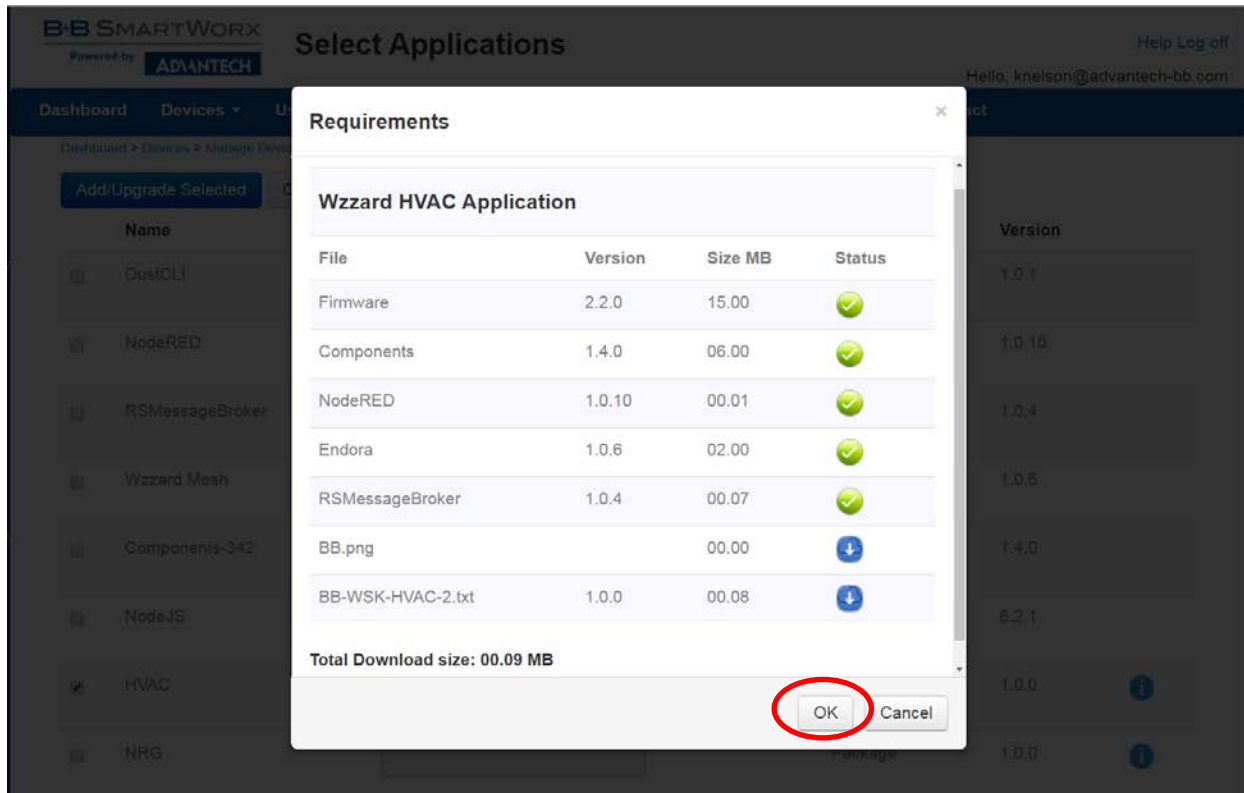
5. Check the box next to HVAC. A list of components to be updated will appear.

The screenshot shows the 'Select Applications' page in the B+B SMARTWORX interface. The page title is 'Select Applications' and the user is logged in as 'Hello, knelson@advantech-bb.com'. The navigation menu includes 'Dashboard', 'Devices', 'Users', 'Technology Providers', 'Configuration Profiles', 'Password', and 'Contact'. The breadcrumb trail is 'Dashboard > Devices > Manage Device > Select Applications'. There are two buttons at the top: 'Add/Upgrade Selected' and 'Cancel'. The main content is a table with the following columns: Name, Tag, Type, and Version. The table contains the following rows:

Name	Tag	Type	Version
<input type="checkbox"/> DustCLI	<input type="text"/>	Application	1.0.1
<input type="checkbox"/> NodeRED	<input type="text"/>	Application	1.0.10
<input type="checkbox"/> RSMMessageBroker	<input type="text"/>	Application	1.0.4
<input type="checkbox"/> Wzzard Mesh	<input type="text"/>	Application	1.0.6
<input type="checkbox"/> Components-342	<input type="text"/>	Component	1.4.0
<input type="checkbox"/> NodeJS	<input type="text"/>	Component	6.2.1
<input checked="" type="checkbox"/> HVAC	<input type="text"/>	Package	1.0.0
<input type="checkbox"/> NRG	<input type="text"/>	Package	1.0.0
<input type="checkbox"/> REF	<input type="text"/>	Package	1.0.0

At the bottom left, there is a page number '1' in a box. Information icons (i) are present at the end of the HVAC, NRG, and REF rows.

6. Click **OK** to accept the download.





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

The screenshot shows the 'Select Applications' page in the B+B SMARTWORX interface. At the top left, the logo 'B+B SMARTWORX' is displayed with 'Powered by ADVANTECH' below it. The page title is 'Select Applications'. On the top right, there are links for 'Help' and 'Log off', and a user greeting 'Hello, knelson@advantech-bb.com'. A navigation bar contains links for 'Dashboard', 'Devices', 'Users', 'Technology Providers', 'Configuration Profiles', 'Password', and 'Contact'. Below the navigation bar, a breadcrumb trail reads 'Dashboard > Devices > Manage Device > Select Applications'. Two buttons are visible: 'Add/Upgrade Selected' (circled in red) and 'Cancel'. A table with the following columns: 'Name', 'Tag', 'Type', and 'Version' is shown. The 'HVAC' row is selected with a checked checkbox. Information icons are present next to the 'HVAC' and 'NRG' rows.

Name	Tag	Type	Version
<input type="checkbox"/> DustCLI	<input type="text"/>	Application	1.0.1
<input type="checkbox"/> NodeRED	<input type="text"/>	Application	1.0.10
<input type="checkbox"/> RSMMessageBroker	<input type="text"/>	Application	1.0.4
<input type="checkbox"/> Wzzard Mesh	<input type="text"/>	Application	1.0.6
<input type="checkbox"/> Components-342	<input type="text"/>	Component	1.4.0
<input type="checkbox"/> NodeJS	<input type="text"/>	Component	6.2.1
<input checked="" type="checkbox"/> HVAC	<input type="text"/>	Package	1.0.0
<input type="checkbox"/> NRG	<input type="text"/>	Package	1.0.0

- 8. The download could take several minutes. To monitor the progress, select **History** from the **Manage Device** screen.

The screenshot displays the 'Manage Device' page in the B+B SMARTWORX interface. The page includes a navigation menu with options like Dashboard, Devices, Users, Technology Providers, Configuration Profiles, Password, and Contact. The main content area shows device details for ID 203-01-6500433, which is currently 'Operational' and running 'Firmware 2.2.0'. A 'Push' button is available for the firmware. The 'History' button at the bottom is highlighted with a red circle.

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.

**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** 203-01-6500433

**Device ID** 203-01-6500433

**Registered On** 29/03/2018 17:45:58

**Last Check In** 18/04/2018 19:51:55

Show  entries

Command	Created by	Name	Queued	Completed	Success	Response
UploadConfig	203-01-6500433	2.2.0	18/04/2018 19:51:55	18/04/2018 19:51:55	✓	{"config": "swm_firewa...
UploadConfig	203-01-6500433	2.2.0	18/04/2018 19:51:45	18/04/2018 19:51:45	✓	{"config": "swm_firewa...
AddFlow	knelson@advantech-bb.com	HVAC	18/04/2018 19:51:43	4/18/2018 7:54:07 PM	✓	Success, [{"fe56bf71.e4cfd"}]
GetFlow	knelson@advantech-bb.com	HVAC	18/04/2018 19:51:43	18/04/2018 19:51:47	✓	
InstallNewApp	knelson@advantech-bb.com	HVAC	18/04/2018 19:51:43	18/04/2018 19:51:43	✓	Completed
GetBinaryFile	knelson@advantech-bb.com		18/04/2018 19:51:43	18/04/2018 19:51:45	✓	
DownloadSettings	knelson@advantech-bb.com	swm_firewall	18/04/2018 19:51:43	18/04/2018 19:51:45	✓	
DownloadSettings	knelson@advantech-bb.com	swm_firewall	18/04/2018 19:51:43	18/04/2018 19:51:44	✓	
UninstallApp	knelson@advantech-bb.com	NRG	18/04/2018 19:45:10	18/04/2018 19:45:10	✓	
GetVersions	203-01-6500433		18/04/2018 14:59:01	18/04/2018 14:59:07	✓	{"apps": [{"name": "R...

Showing 1 to 10 of 98 entries

Cancel

← Previous 1 2 3 4 5 Next →

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POINTING THE MQTT DATA TO THE INTERNAL MQTT BROKER

- 1. From the **Manage Device** screen, click the **Wzzard Mesh** application.

**Manage Device**

Dashboard > Devices > Manage Device

Device ID: 203-01-6500433

Name: 203-01-6500433

Status: Operational

Firmware: 2.2.0 **Push**

DeviceType: SG30000525-42

MAC Address: 00:0A:14:86:77:C6

Online:

Settings: Select...

**Save** Cancel History Add/Upgrade Apps Geo Location **Wzzard Mesh**

**Manage Apps**

Remove Selected

Name	Tag	Type	Version	Help	Added
<input type="checkbox"/> NodeJS	NodeJS	Component	6.2.1		18/04/2018 14:51:22
<input checked="" type="checkbox"/> <b>Wzzard Mesh</b>	Wzzard Mesh	Application	1.0.6		29/03/2018 17:55:17
<input type="checkbox"/> NodeRED	NodeRED	Application	1.0.10		17/04/2018 20:57:46
<input type="checkbox"/> RSMMessageBroker	RSMMessageBroker	Application	1.0.4		17/04/2018 20:57:46
<input type="checkbox"/> Components-342	Components-342	Component	1.4.0		29/03/2018 17:55:17

2. Fill in the **Application Settings** screen as shown and click the **Apply Changes** button:

MQTT

### Application Settings

Device ID 203-01-6500433

Application Name Wzzard Mesh

Version 1.0.6

Tag

\* Required Field

---

MQTT

Host:

Port:

Username:

Password:

Client ID:  \*

Timeout (secs):

Retry Interval (secs):

Keep Alive (secs):

Reliability:

Clean Session:

---

Enable TLS:  ▼

Verify Server Cert:

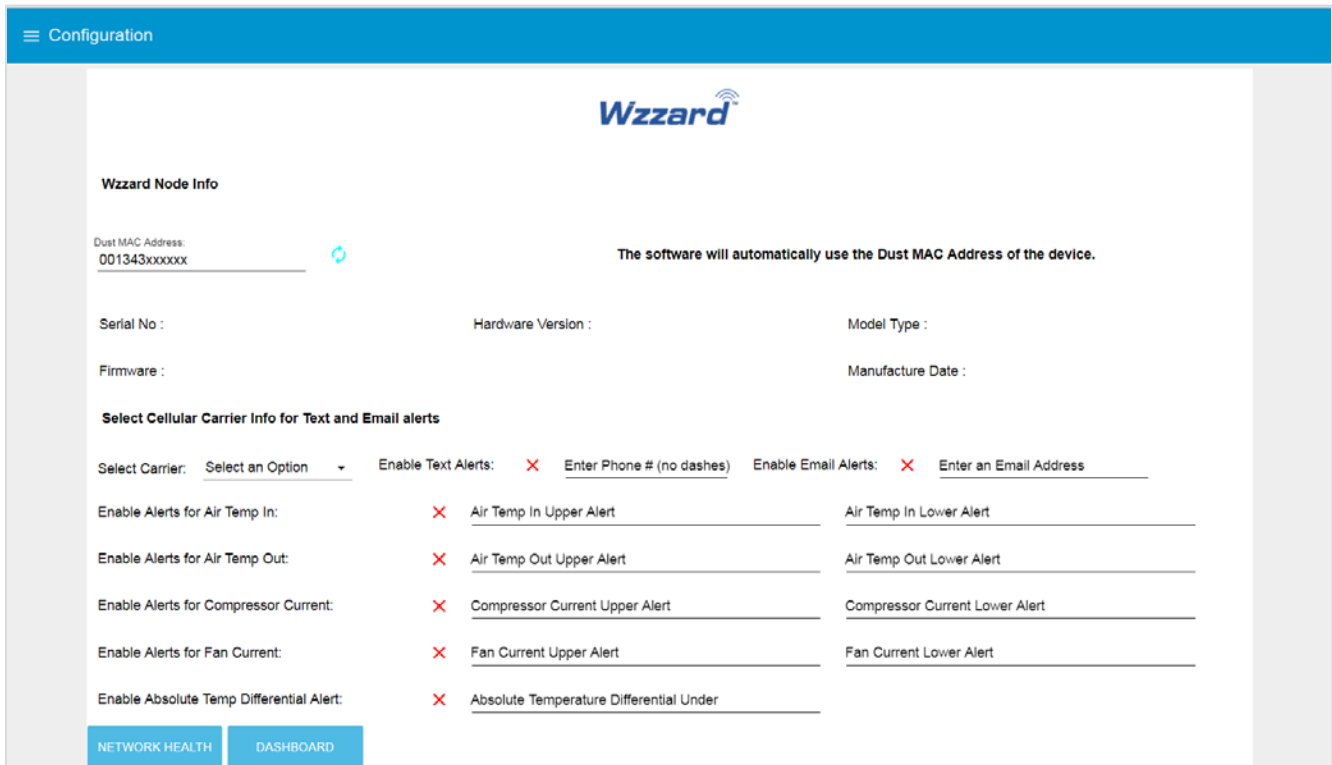
**WAKE UP WZZARD™ MESH EDGE NODE**

1. Attach the external antenna.
2. Press and hold the **Config/Status** button for 5 seconds until the Status LED starts blinking.
3. Check LED.
4. After you have woken the node, 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 or after 10 seconds. Press the **Config/Status** LED for approximately 1 second to view the LED status.

LED Indicator	Status
OFF (after button press)	Node is asleep or dead battery.
Slow Blink (1 per second)	Attempting to establish connection with Wzzard Mesh network.
Solid ON	Node is connected to a gateway.
Fast Blink (10 per second)	Firmware update in progress.

**ACCESS NODE-RED™ UI IN THE GATEWAY**

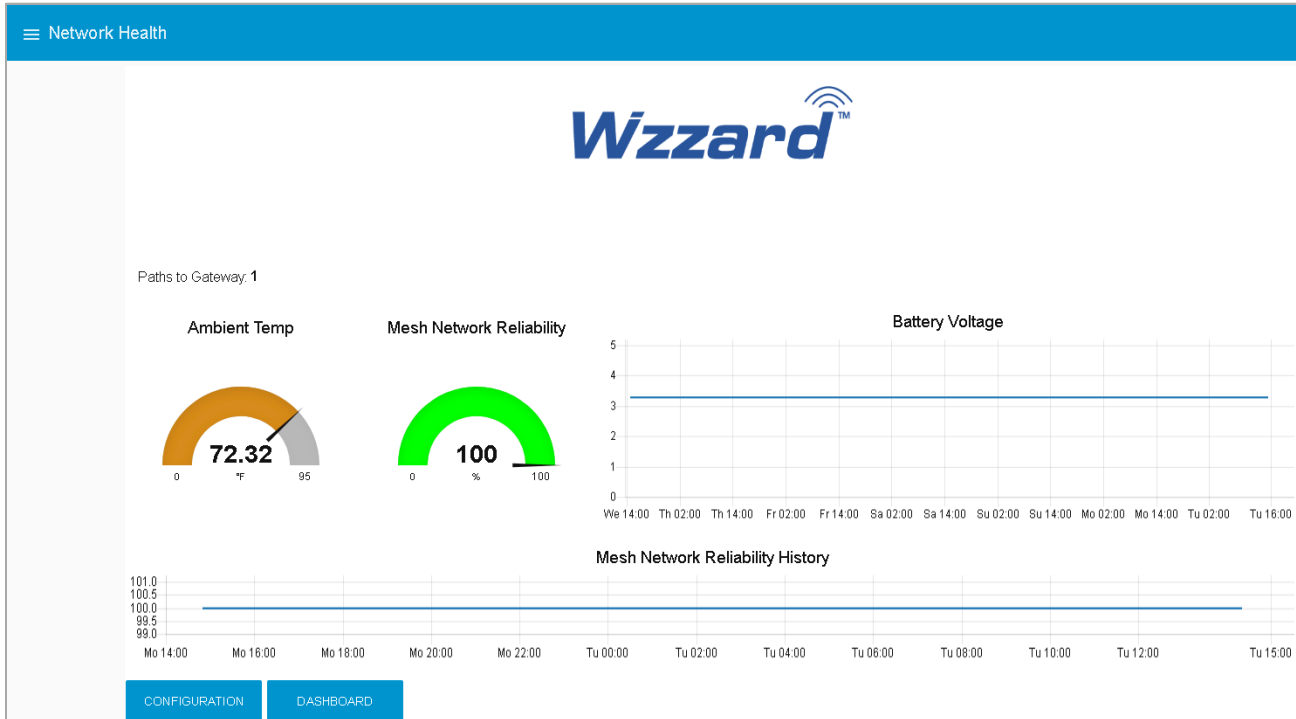
1. Attach the antenna to the Wzzard™ antenna port on the gateway.
2. Attach the Ethernet cable to the ETH0 port on the gateway and the other end to your PC. You will use an Ethernet connection to configure the gateway and to communicate with it.
3. Attach the supplied power supply and plug it in.
4. 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.)



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 to the phone number (ie: 1-123-2345@txt.abcphone.com). See Appendix A for carrier text addresses. If your carrier is not listed, contact your carrier for the address of their SMS gateway.
7. You also can enable or disable alerts as well as setting the trigger values on this page.

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.



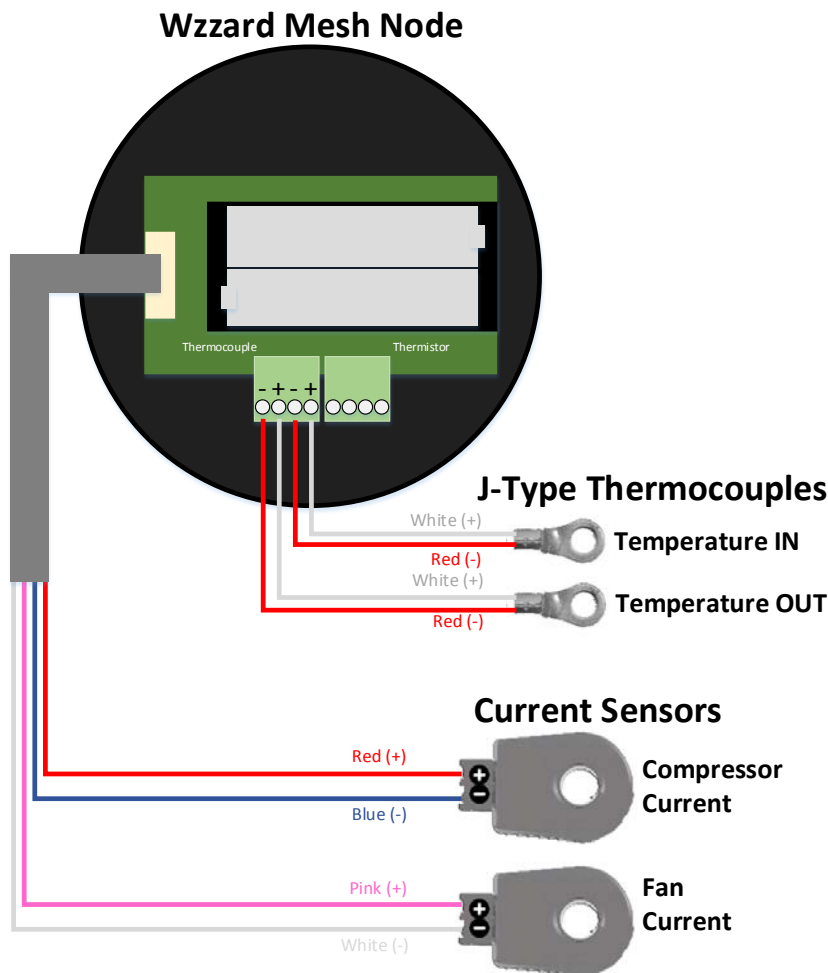


**ATTACHING THE SENSORS ON THE INTELLIGENT EDGE NODES**

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

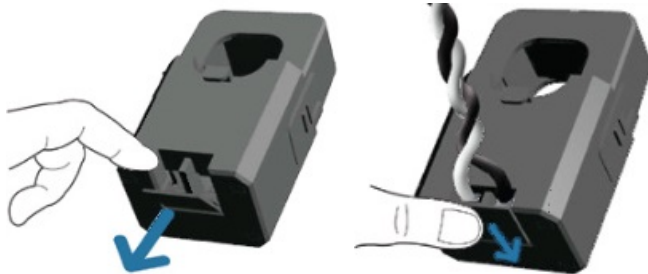
The Wzzard™ HVAC monitoring kit comes with two AC current sensors and two J-Type thermocouples.

Sensor	Wzzard Industrial Node with S&T Cable	Connection
Compressor Current	Sensor (+) to Stripped & Tinned Cable	RED
	Sensor (-) to Stripped & Tinned Cable	BLUE
Fan Current	Sensor (+) to Stripped & Tinned Cable	PINK
	Sensor (-) to Stripped & Tinned Cable	WHITE
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

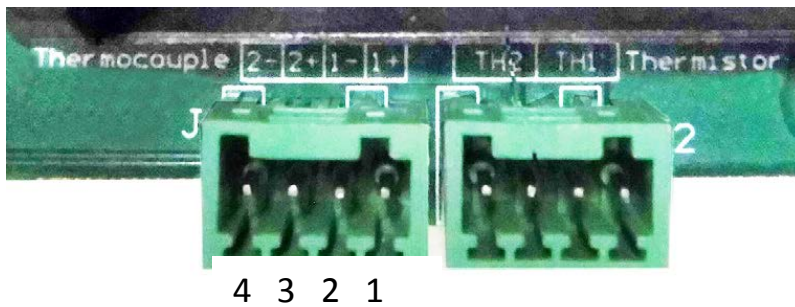


**Current Sensors**

- 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 (-)

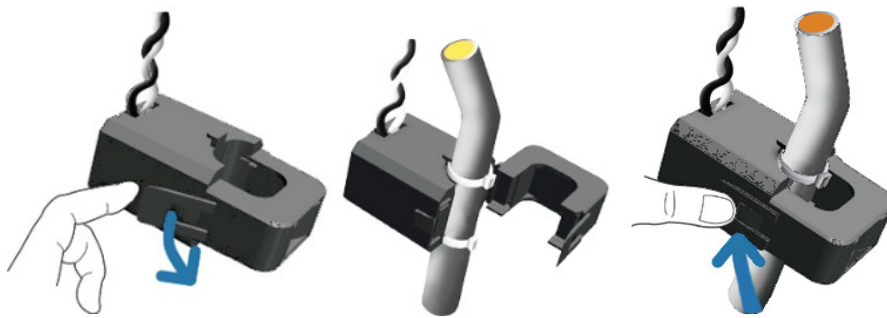
## 2. Mount Your Sensors.

### Current Sensors

The sensor can be mounted in any position.

Open the clamp release by pushing it away from the sensor body.

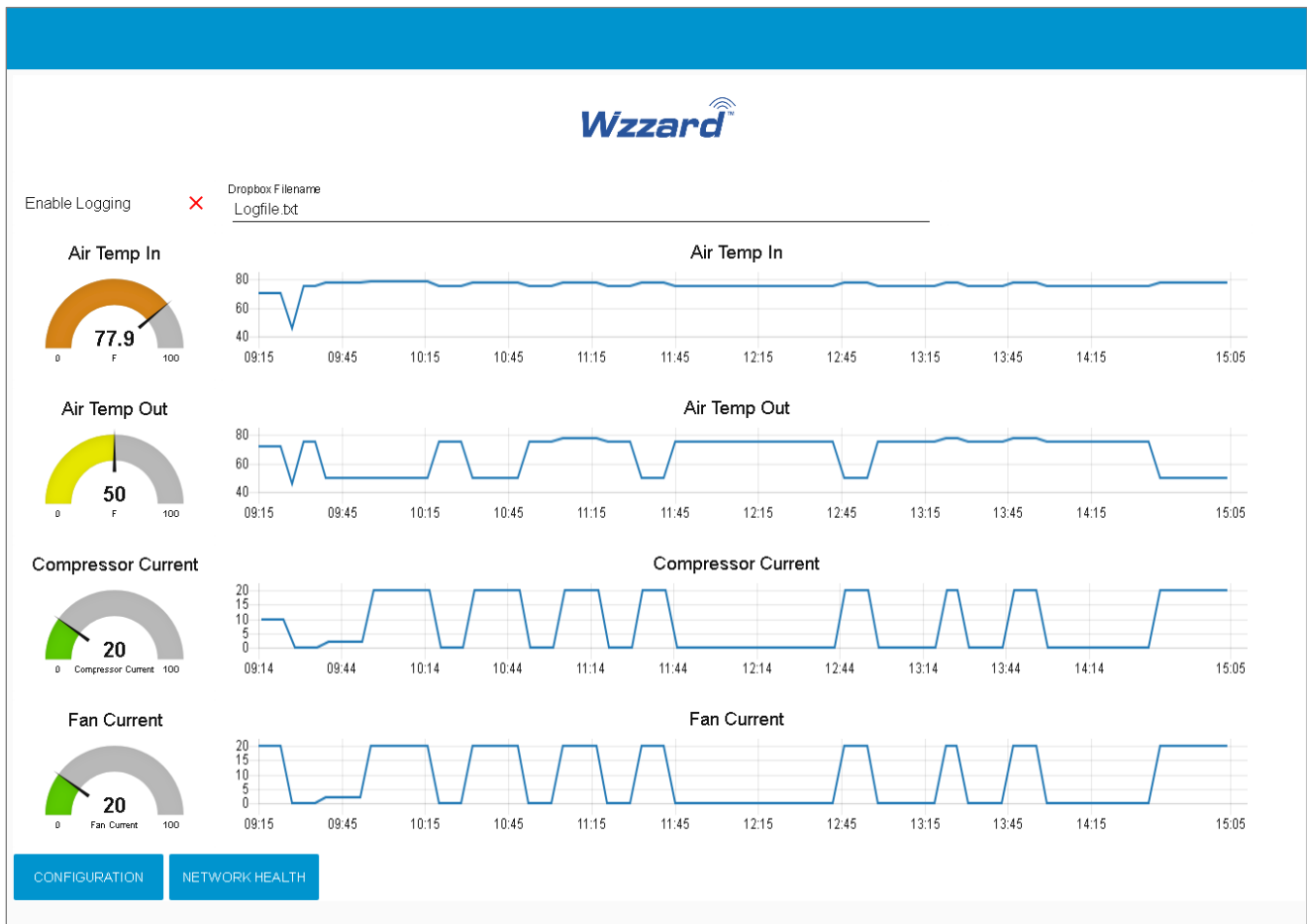
Run the wire you are monitoring through the opening in the sensor.



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

ACCESSING THE DASHBOARD

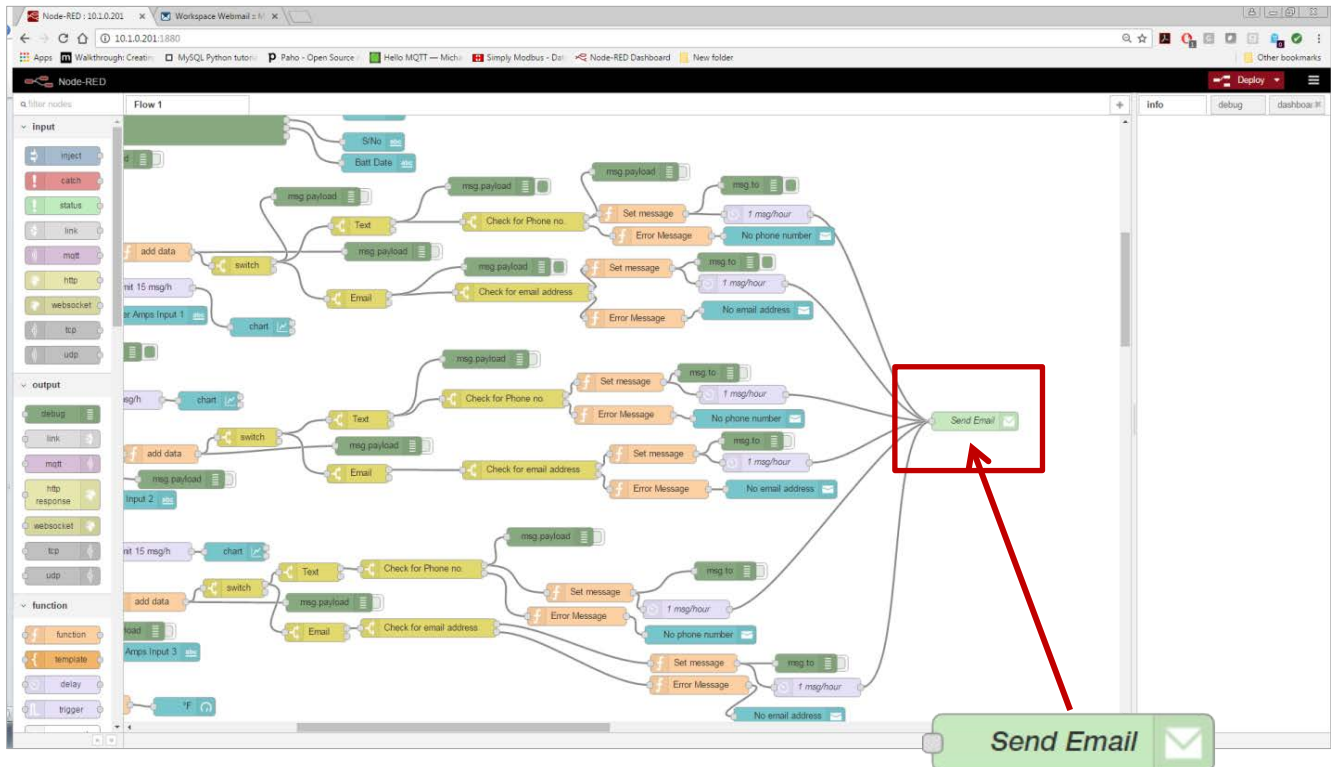
1. Open a browser on your computer and open the Node-RED™ configuration page. The default address is: **192.168.1.1:1880/ui**
2. Click on the **Dashboard** button on the lower left corner of the configuration page.
3. The dashboard should look like the following screen.



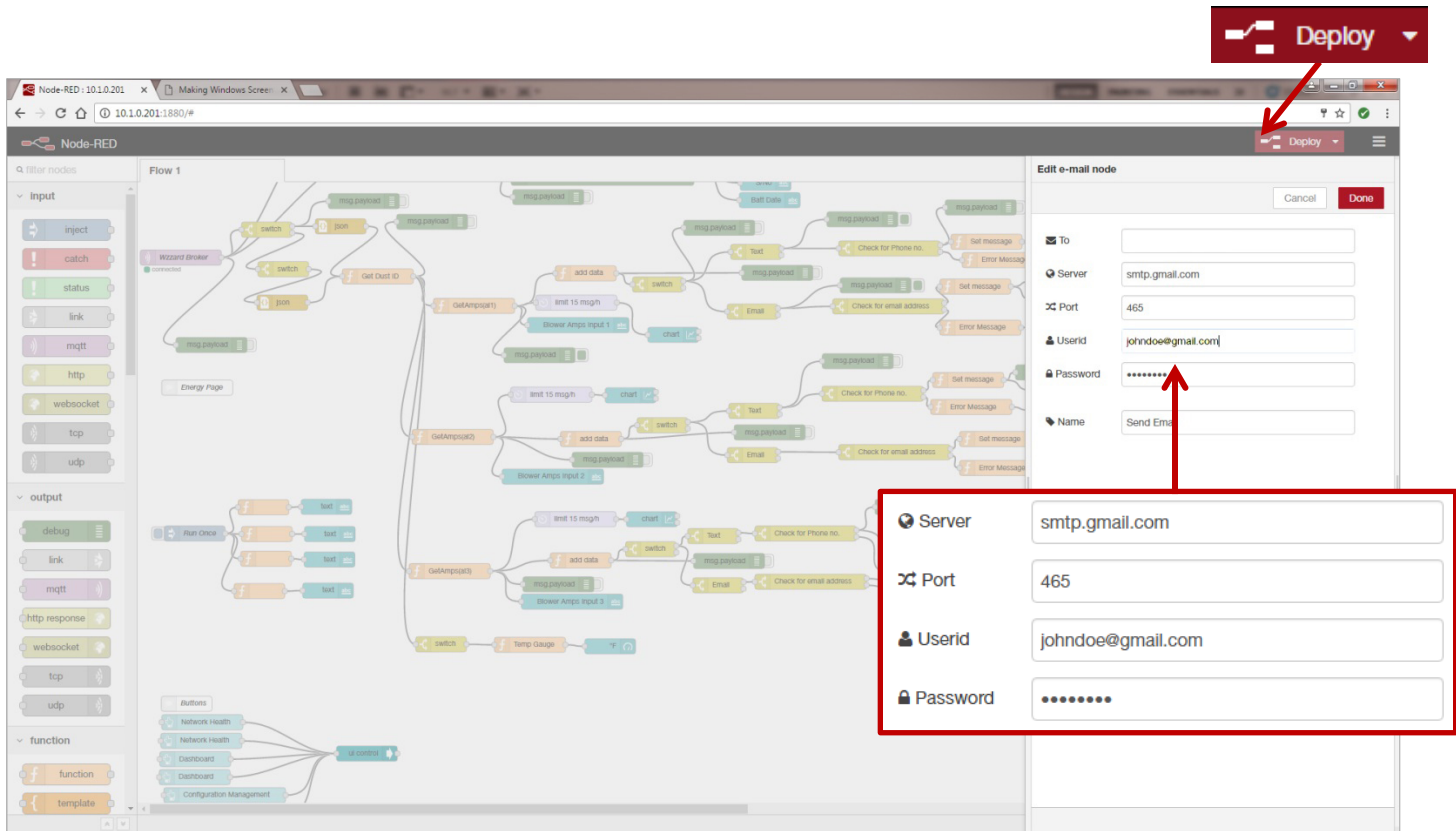
4. You can switch to the **Configuration** page or **Network Health** page by clicking on their respective buttons at the lower left.

SETTING UP AN E-MAIL ACCOUNT

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

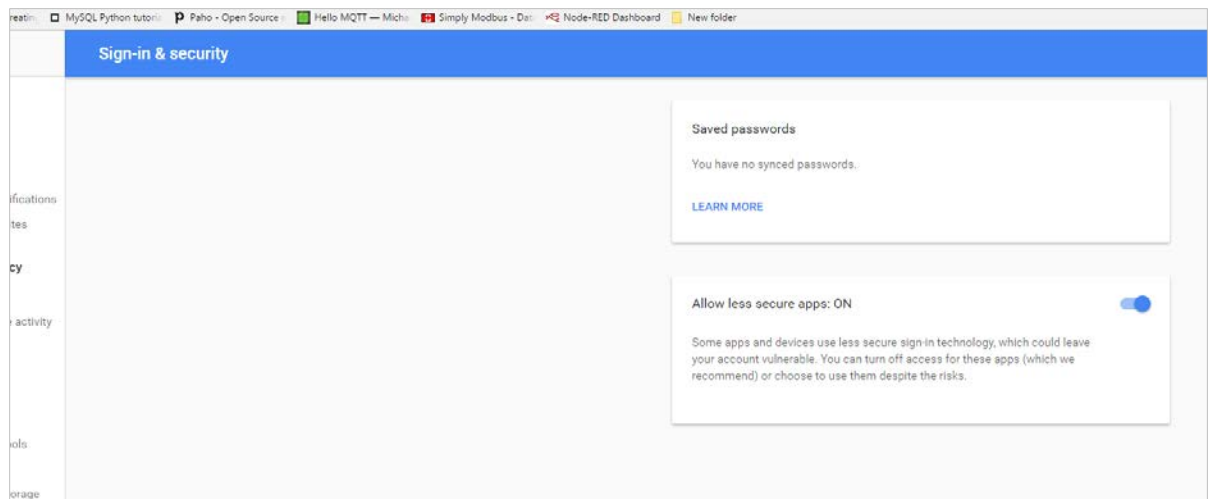


- 2. Locate **Energy Page**, then scroll right and locate the green **Send Email** node; double click on it.



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.

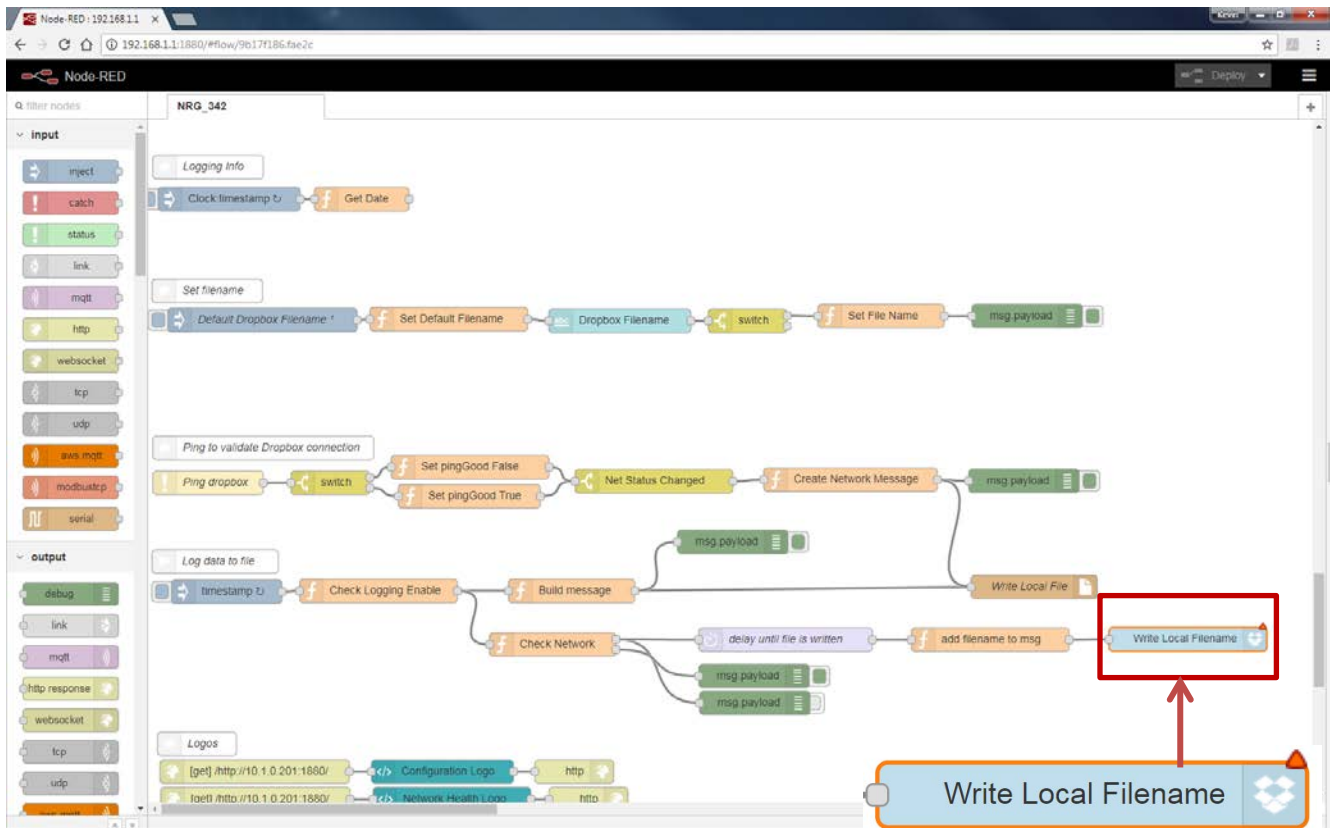
**Note:** Once you deploy the edited flow, you will have to re-enter any alert settings on the Configuration screen of the Dashboard.

### SETTING UP YOUR DROPBOX™ FOR LOGGING

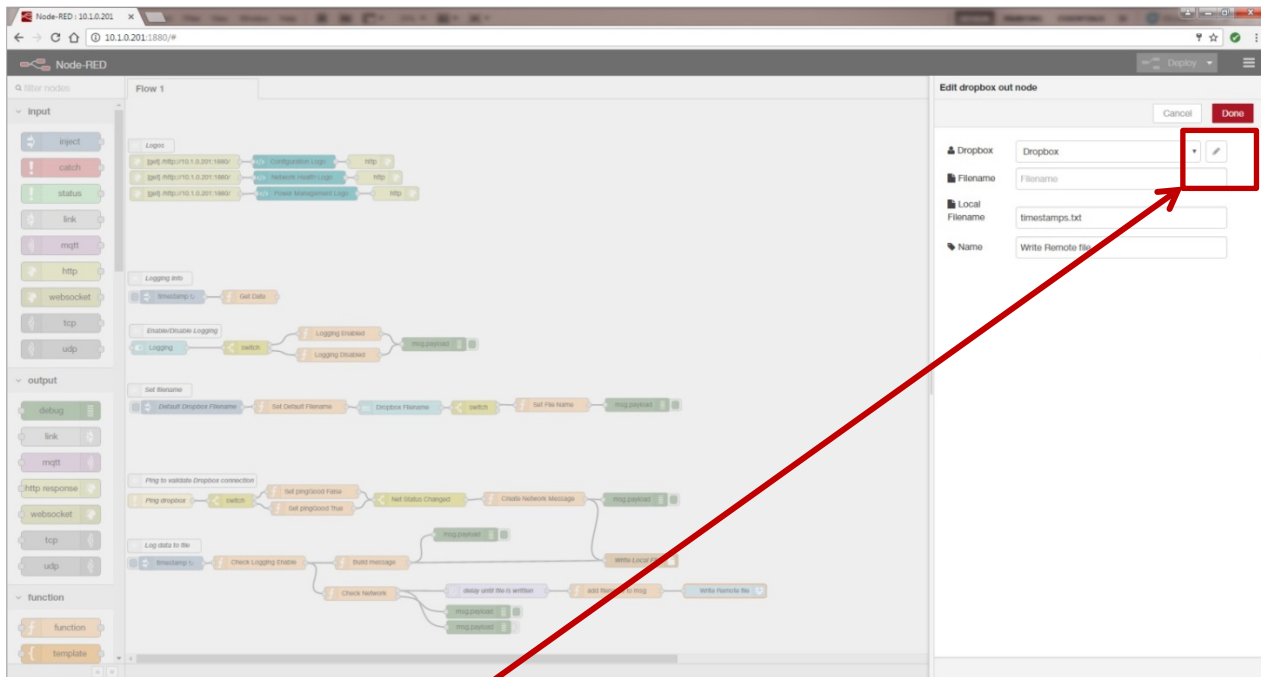
1. Log in to your Dropbox account or sign up for a new one.
2. Once signed up or logged in:
  - Go to <https://www.dropbox.com/developers>
  - Click **Create your app** box in the center of the screen.
  - Select **Dropbox API app**.
  - Choose an appropriate answer as to whether your node should be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

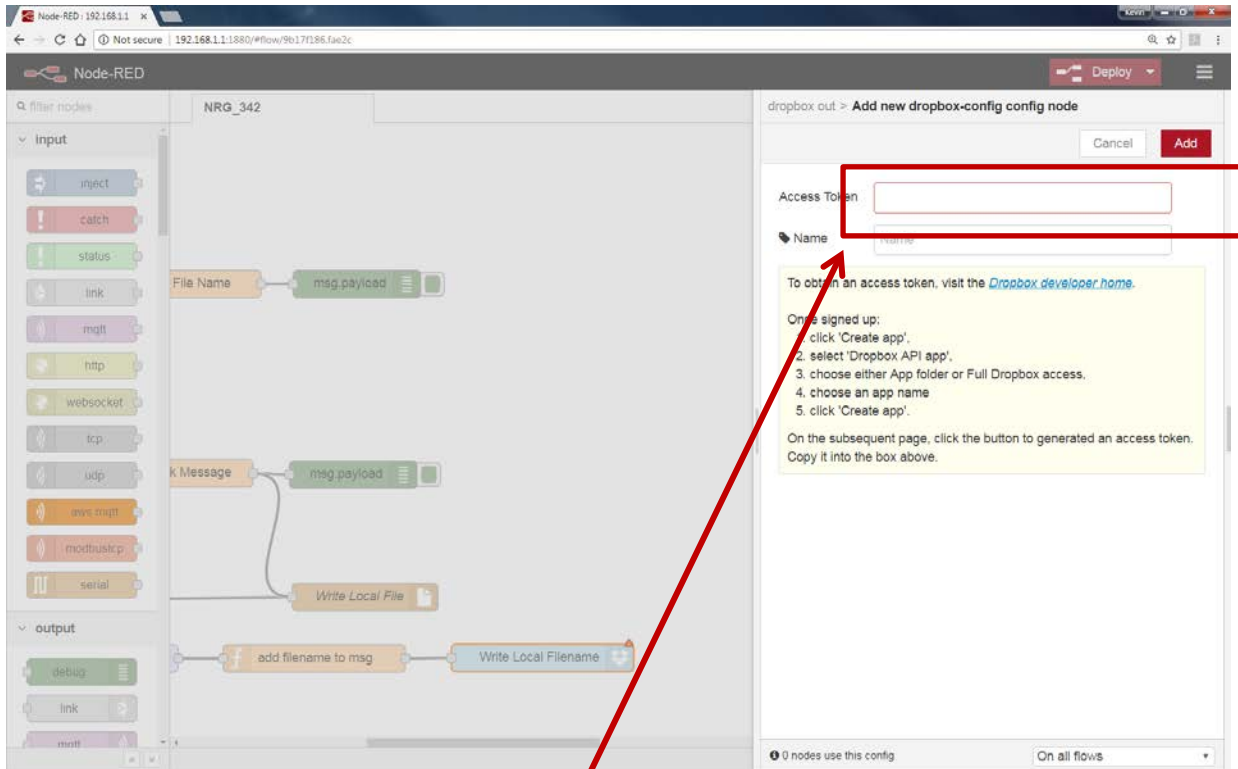


4. Locate **Log data to file**, then scroll right and locate the blue **Write Local Filename** node; double click on it.



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





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

**Note:** Once you deploy the edited flow, you will have to re-enter any alert settings on the Configuration screen of the Dashboard.

**APPENDIX A. CARRIER TEXT MESSAGING URL ADDRESSES**

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

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

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

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