

# Wzzard™ Mesh Gen2 Starter Bundles Refrigeration Monitoring Kit

Model BB-WSK-REF-2

## SETUP MANUAL



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**CONTENTS**

REFRIGERATION MONITORING STARTER KIT.....	4
WZZARD MESH NETWORK SETUP.....	4
DOWNLOADING REFRIGERATION MONITOR Node-RED™ FLOW TO THE GATEWAY.....	5
POINT THE MQTT DATA TO THE INTERNAL MQTT BROKER.....	12
WAKE UP WZZARD™ MESH EDGE NODE.....	14
ACCESS Node-RED™ UI IN THE GATEWAY.....	15
NETWORK HEALTH PAGE.....	16
ATTACHING THE SENSORS ON THE INTELLIGENT EDGE NODES.....	17
MOUNTING YOUR SENSORS.....	18
ACCESSING THE DASHBOARD.....	19
SETTING UP AN E-MAIL ACCOUNT.....	20
SETTING UP YOUR DROPBOX FOR LOGGING.....	22
APPENDIX A. CARRIER TEXT MESSAGING URL ADDRESSES.....	25
Node-RED™ SOFTWARE LICENSE.....	27
ADVANTECH TECHNICAL SUPPORT.....	28

**REFRIGERATION MONITORING STARTER KIT****Kit Model BB-WSK-REF-2**

The Wzzard™ Mesh Refrigeration Monitoring Application Kit provides a non-intrusive, easily installed solution for monitoring internal and external temperature, door open/closed and current draw on refrigeration equipment without disrupting your existing facility operations. 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 Mesh 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 pre-installed on the gateway, you can monitor your cooler or freezer performance from any web browser on your network.

**The contents of the kit include:**

Qty 1	BB-WCD1H2102H	Commercial Temperature/Humidity Wzzard Mesh Node
Qty 2	BB-JC10F50-V	50A Clamp-on Current Sensor
Qty 1	BB-WCHCBL	Thermistor/Breakout Cable
Qty 1	BB-WCHMS	Door Sensor Cable
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.

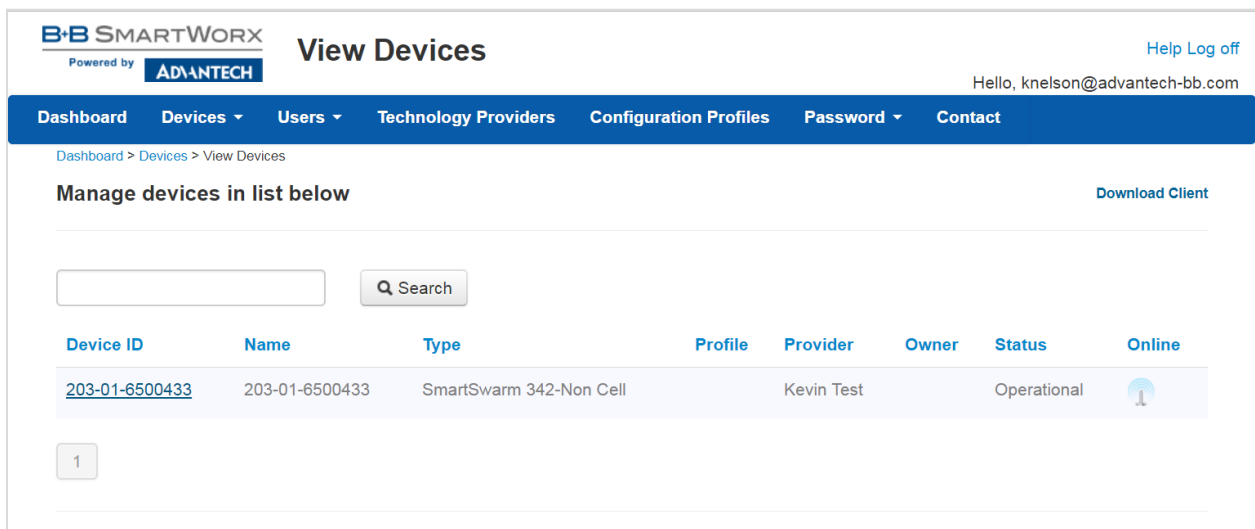
## DOWNLOADING REFRIGERATION MONITOR NODE-RED™ FLOW TO THE GATEWAY

NOTE: The gateway 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's 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** tab.

**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** Operational ▾

**Firmware** 2.2.0 ▾ Push

**Device Type** 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"/>	<a href="#">Wzzard Mesh</a>	Wzzard Mesh	Application	1.0.6		29/03/2018 17:55:17
<input type="checkbox"/>	<a href="#">Components-342</a>	Components-342	Component	1.4.0		29/03/2018 17:55:17

1

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



## Select Applications

[Help](#) [Log off](#)  
 Hello, knelson@advantech-bb.com

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

Dashboard > Devices > Manage Device > Select Applications

Add/Upgrade Selected
Cancel

	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"/>	RSMessagesBroker	<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 type="checkbox"/>	HVAC	<input type="text"/>	Package	1.0.0	<a href="#">i</a>
<input type="checkbox"/>	NRG	<input type="text"/>	Package	1.0.0	<a href="#">i</a>
<input checked="" type="checkbox"/>	REF	<input type="text"/>	Package	1.0.0	<a href="#">i</a>

1

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

**Requirements**

**Wzzard Refrigeration Monitoring Application**

File	Version	Size MB	Status
Firmware	2.2.0	15.00	✓
Components	1.4.0	06.00	✓
NodeRED	1.0.10	00.01	✓
Endora	1.0.6	02.00	✓
RSMesageBroker	1.0.4	00.07	✓
BB.png		00.00	↓
BB-WSK-REF-2.txt	1.0.0	00.09	↓

Total Download size: 00.10 MB

OK Cancel



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

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

**Select Applications**

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

Dashboard Devices Users Technology Providers Configuration Profiles Password Contact

Dashboard > Devices > Manage Device > Select Applications

**Add/Upgrade Selected** Cancel

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"/> RSMessagesBroker	<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 type="checkbox"/> HVAC	<input type="text"/>	Package	1.0.0 <span>i</span>
<input type="checkbox"/> NRG	<input type="text"/>	Package	1.0.0 <span>i</span>
<input checked="" type="checkbox"/> REF	<input type="text"/>	Package	1.0.0 <span>i</span>

1

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

**B+B SMARTWORX** Manage Device  
 Powered by **ADVANTECH**

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

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

**NOTE:** “AddNode” commands will show an **X** if they have already been installed.

**History**

Powered by

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** 19/04/2018 16:40:47

Show  entries

Command	Created by	Name	Queued	Completed	Success	Response
UploadConfig	203-01-6500433	2.2.0	19/04/2018 16:38:42	19/04/2018 16:38:42	✓	{"config": "swm_firewa..."}
UploadConfig	203-01-6500433	2.2.0	19/04/2018 16:38:31	19/04/2018 16:38:31	✓	{"config": "swm_firewa..."}
AddFlow	knelson@advantech-bb.com	REF	19/04/2018 16:38:26	4/19/2018 4:42:23 PM	✓	Success, ["cfcc09de.5a9a48"]
GetFlow	knelson@advantech-bb.com	REF	19/04/2018 16:38:26	19/04/2018 16:38:33	✓	
InstallNewApp	knelson@advantech-bb.com	REF	19/04/2018 16:38:26	19/04/2018 16:38:26	✓	Completed
GetBinaryFile	knelson@advantech-bb.com		19/04/2018 16:38:26	19/04/2018 16:38:31	✓	
DownloadSettings	knelson@advantech-bb.com	swm_firewall	19/04/2018 16:38:26	19/04/2018 16:38:31	✓	
DownloadSettings	knelson@advantech-bb.com	swm_firewall	19/04/2018 16:38:26	19/04/2018 16:38:30	✓	
GetVersions	203-01-6500433		18/04/2018 21:27:59	18/04/2018 21:28:05	✓	{"apps": [{"name": "R..."}
RemoveFlow	knelson@advantech-bb.com	HVAC	18/04/2018 21:23:46	18/04/2018 21:23:52	✓	Success

Showing 1 to 10 of 122 entries

Cancel

← Previous
1
2
3
4
5
Next →

**Note:** If, for some reason all or a portion of the installation fails, repeat the procedure to install the rest of the package.

## POINT THE MQTT DATA TO THE INTERNAL MQTT BROKER

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

The screenshot shows the 'Manage Device' interface for a device with ID 203-01-6500433. The device is operational and running firmware 2.2.0. The 'Manage Apps' section contains a table with the following data:

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"/> Wzzard Mesh	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

The 'Wzzard Mesh' application is highlighted with a red circle in the original image. Below the table, there are buttons for 'Save', 'Cancel', 'History', 'Add/Upgrade Apps', 'Geo Location', and 'Wzzard Mesh'.

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:	<input type="text" value="192.168.1.1"/>
Port:	<input type="text" value="1883"/>
Username:	<input type="text"/>
Password:	<input type="text"/>
Client ID:	<input type="text" value="122"/> *
Timeout (secs):	<input type="text" value="60"/>
Retry Interval (secs):	<input type="text" value="10"/>
Keep Alive (secs):	<input type="text" value="60"/>
Reliability:	<input checked="" type="checkbox"/>
Clean Session:	<input checked="" type="checkbox"/>
Enable TLS:	<input style="border: 1px solid #ccc;" type="text" value="No"/>
Verify Server Cert:	<input type="checkbox"/>

## WAKE UP WZZARD™ MESH EDGE NODE

1. Press and hold the **Config/Status** button for 5 seconds until the Status LED starts blinking.
2. Check LED.
3. After you have awakened 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™ Mesh 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.)

Configuration

**Wzzard**

**Wzzard Node Info**

Dust MAC Address: 00170D0000310AA3 ↻ **The software will automatically use the Dust MAC Address of the device.**

Serial No : \_\_\_\_\_ Hardware Version : \_\_\_\_\_

Model Type : \_\_\_\_\_ Firmware : \_\_\_\_\_ Manufacture Date : \_\_\_\_\_

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

Select Carrier: Select an Option Enable Text Alerts:  Enter Phone # (no dashes) Enable Email Alerts:  Enter an Email Address

Enable Alerts for Chamber Temp:  Chamber Temp Upper Alert (°F) Chamber Temp Lower Alert (°F)

Enable Alerts for Ambient Temp:  Ambient Temp Upper Alert (°F) Ambient Temp Lower Alert (°F)

Enable Alerts for Humidity:  Humidity Upper Alert (%) Humidity Lower Alert (%)

Enable Alerts for Compressor Current:  Compressor Current Upper Alert (Amps) Compressor Current Lower Alert (Amps)

Enable Alerts for Fan Current:  Fan Current Upper Alert (Amps) Fan Current Lower Alert (Amps)

Enable Open Door Alert:  Door Open Timer (Minutes)

**NETWORK HEALTH** **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 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 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 (see previous screen). The page below appears. This page shows the status of the network.

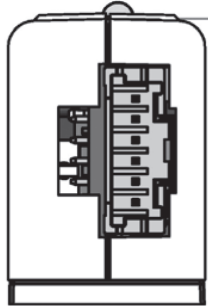




## ATTACHING THE SENSORS ON THE INTELLIGENT EDGE NODES

The Wzzard™ Mesh Refrigeration Monitoring Kit comes with built-in sensors for ambient temperature and humidity, along with two AC current sensors, a door switch, and a breakout cable with 10K thermistor.

1. Plug the Breakout/Thermistor Cable into the Molex connector on the bottom of the Wzzard Mesh node.

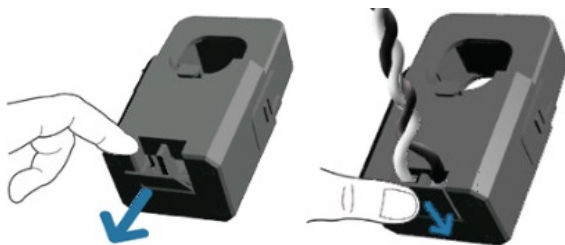


2. Plug the door sensor into the 2-pin connector on the breakout cable.
3. Connect the sensors for compressor and fan current to the bare wires on the breakout cable.

Sensor	Breakout Cable	Connection
Compressor Current	Sensor (+) to Stripped & Tinned Cable	AIN1 RED
	Sensor (-) to Stripped & Tinned Cable	AIN1 BLACK
Fan Current	Sensor (+) to Stripped & Tinned Cable	AIN2 YELLOW
	Sensor (-) to Stripped & Tinned Cable	AIN2 BLACK

### Current Sensors

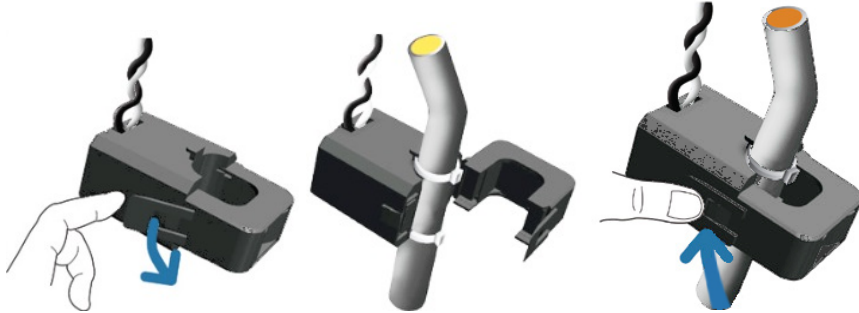
1. Open the wire protector clamp by pushing it away from the sensor body.
2. Attach your wires.
3. Close the wire protector clamp.



**MOUNTING YOUR SENSORS****Current Sensors**

The sensor can be mounted in any position.

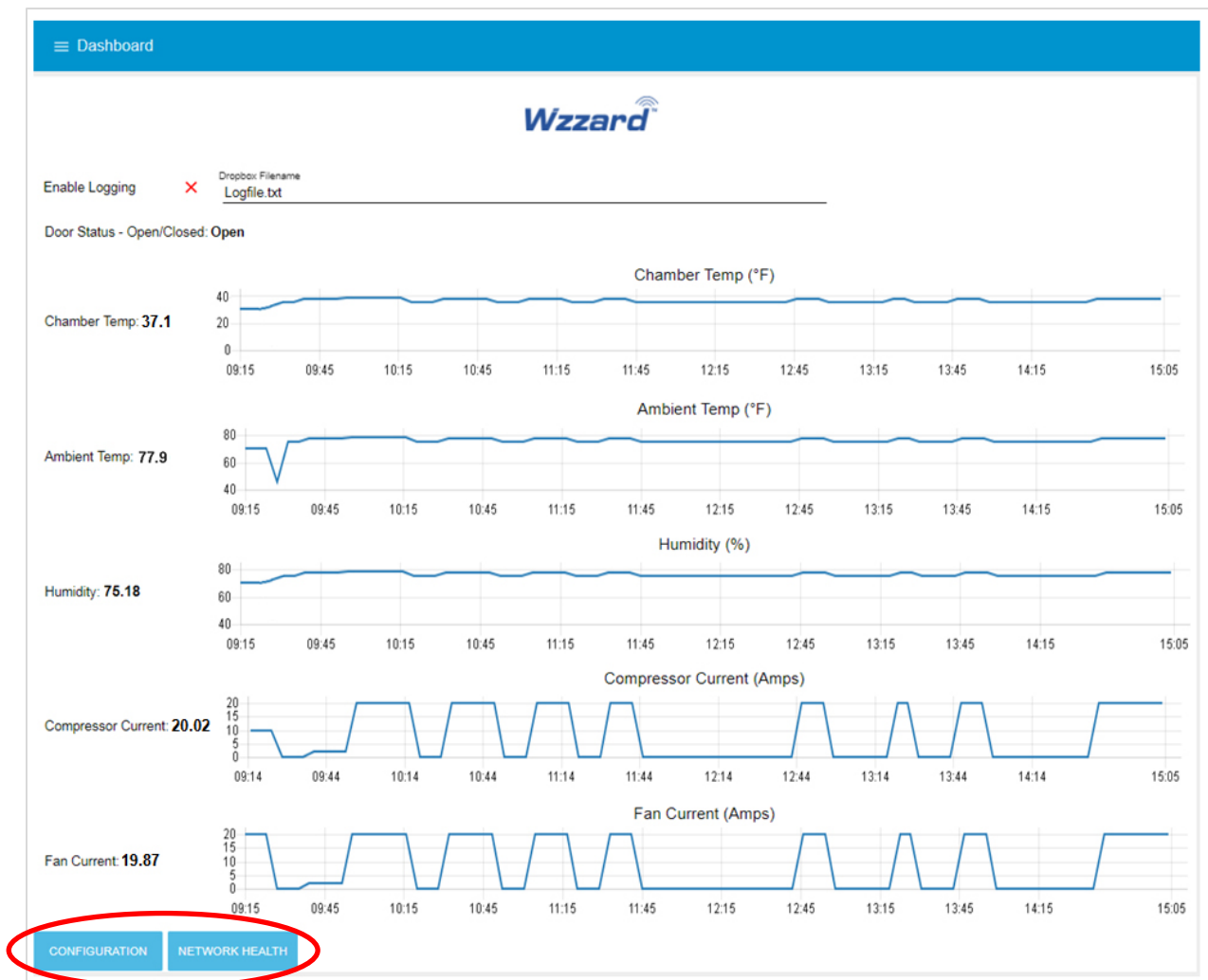
1. Open the clamp release by pushing it away from the sensor body. Run the wire you are monitoring through the opening in the sensor.



2. 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.

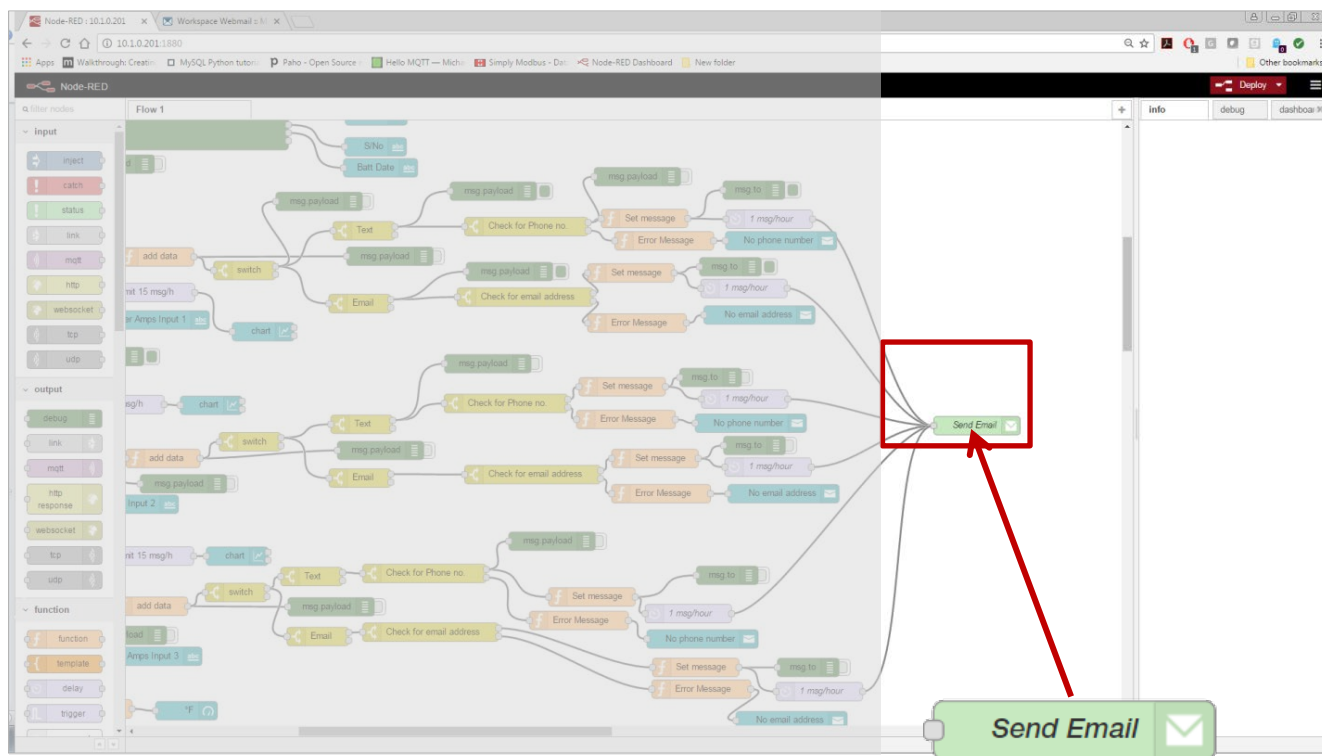


## SETTING UP AN E-MAIL ACCOUNT

1. From your browser, open the Node-RED™ flow at **192.168.1.1:1880**.
2. Enter your user name and password. Default is:

Username: **NodeRED**

Password: **5mart5warm** (set same as the SmartSwarm 342 password).



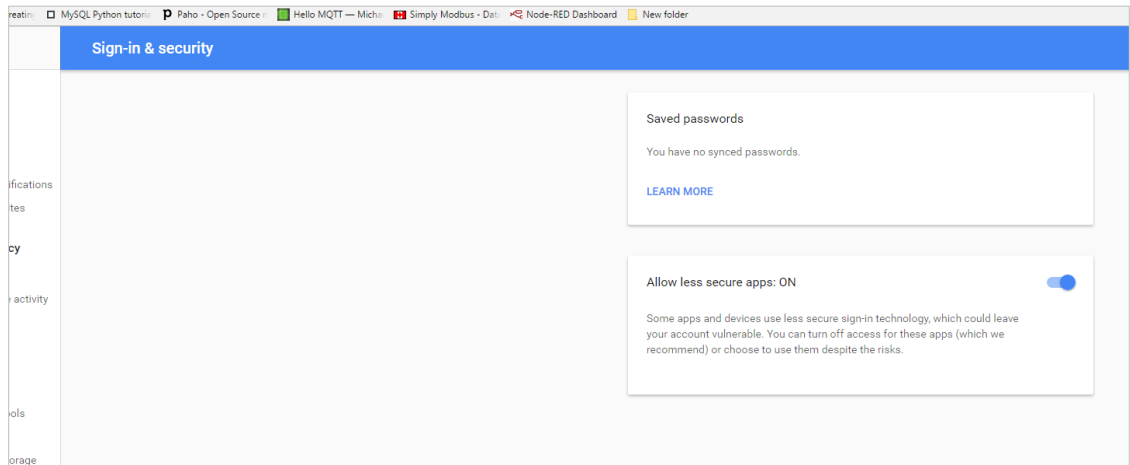
3. Find the green **Send Email** node on the right; double click on it.



The screenshot shows the Node-RED web interface. On the left is a palette of nodes categorized into Input, output, and function. The main workspace contains a complex flow diagram with various nodes like 'inject', 'switch', 'mqtt', 'http', and 'email'. On the right, the 'Edit e-mail node' dialog is open, showing fields for 'To', 'Server', 'Port', 'UserID', 'Password', and 'Name'. A red box highlights the 'Server', 'Port', 'UserID', and 'Password' fields, and a red arrow points to the 'Password' field.

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.

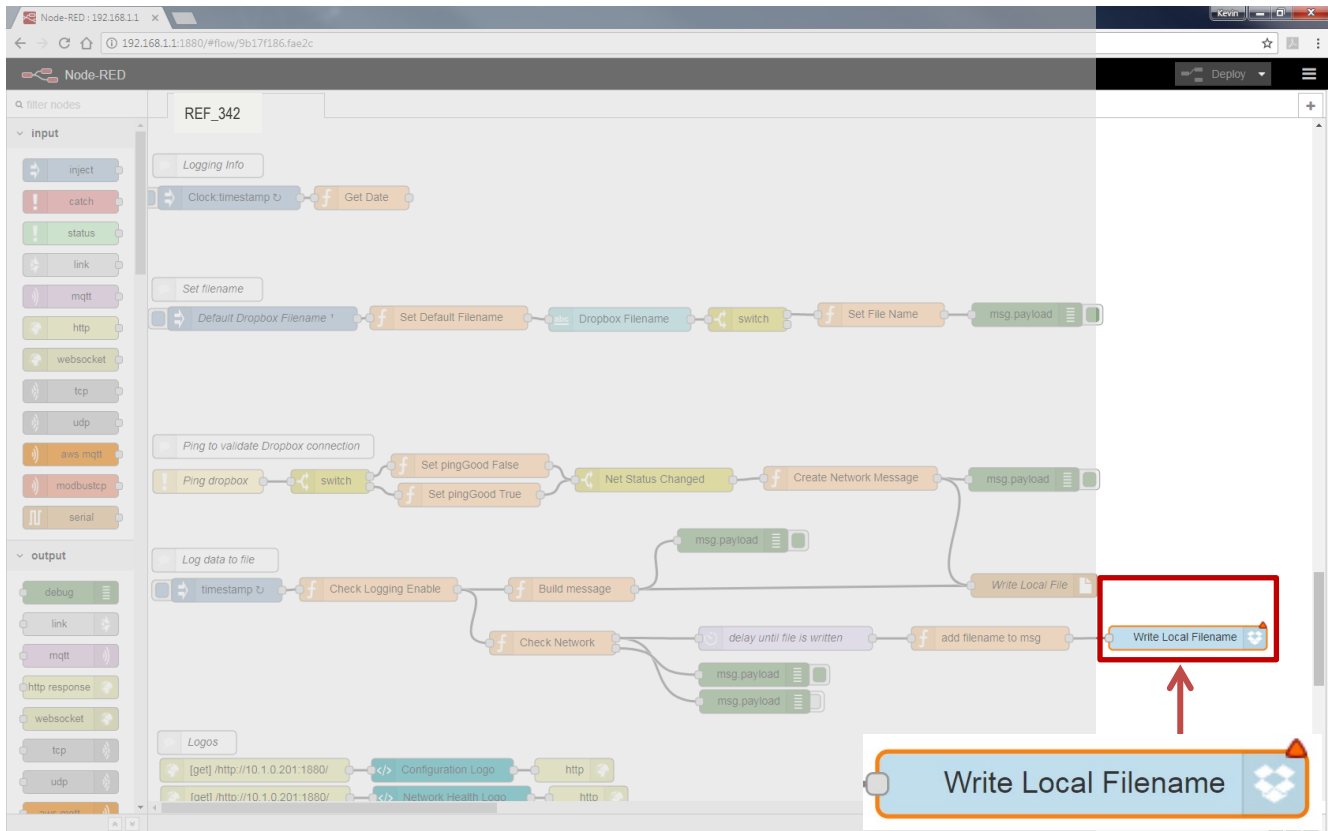
**Note:** Once you deploy the edited flow, you will have to re-enter any alert settings on the configuration screen of the dashboard.

## SETTING UP YOUR DROPBOX FOR LOGGING

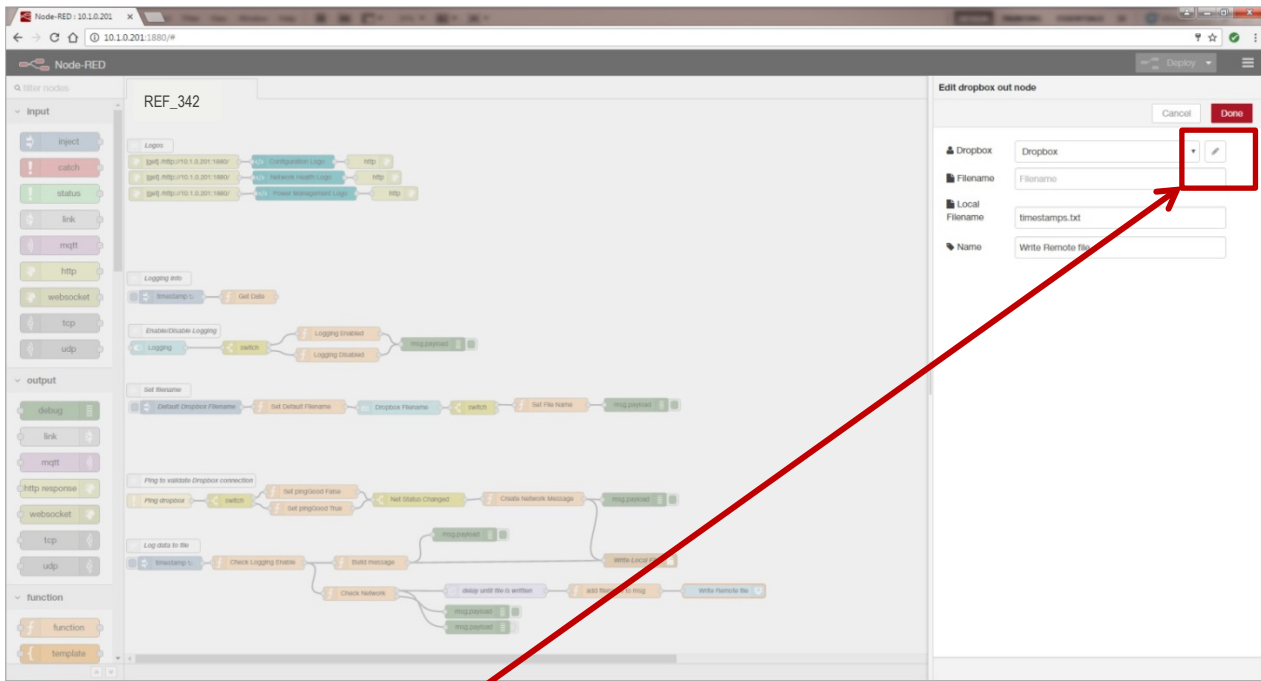
1. Log in to your Dropbox account or sign up for a new one.
2. Once signed up or logged in:
  - Go to <https://www.dropbox.com/developers>
  - Click **Create Your App** box in the center of the screen.
  - Select **Dropbox API App**.
  - Choose an appropriate answer as to whether your node should be 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. Save this string so you can enter it into the application later.
3. From your browser, open the Node-RED™ flow at **192.168.1.1:1880**.
4. Enter your user name and password. Default is:
 

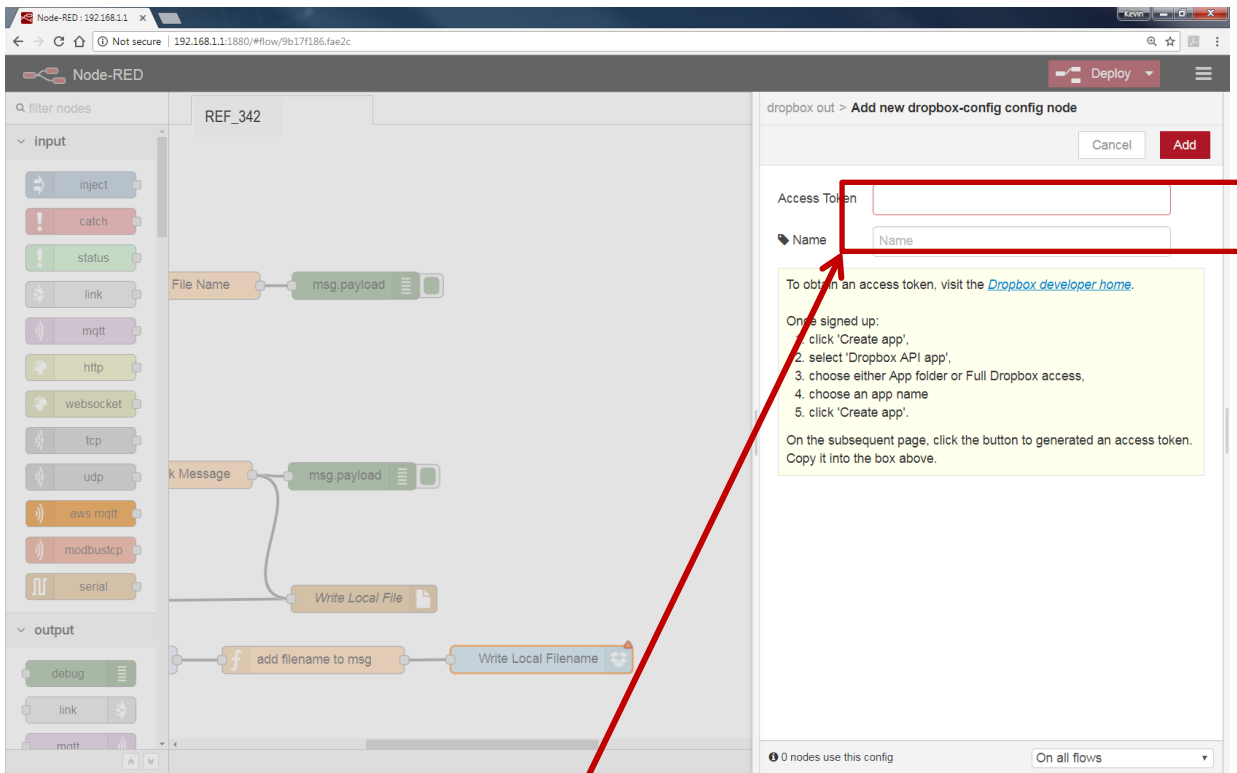
Username: **NodeRED**  
 Password: **5mart5warm** (set same as the SmartSwarm 342 password).



5. Locate **Log data to file**, then scroll right to locate blue **Write Local File** node; double click on it.



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



6. Fill in the **Access Token** that you got from Dropbox. (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.

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

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 Example: 1234567890@message.alltel.com
AT&T (formerly Cingular)	[10-digit phone number]@txt.att.net [10-digit phone number]@cingularme.com Example: 1234567890@txt.att.net
Boost Mobile	[10-digit phone number]@myboostmobile.com Example: 1234567890@myboostmobile.com
Nextel (now Sprint Nextel)	[10-digit telephone number]@messaging.nextel.com Example: 1234567890@messaging.nextel.com
Sprint PCS (now Sprint Nextel)	[10-digit phone number]@messaging.sprintpcs.com Example: 1234567890@messaging.sprintpcs.com
T-Mobile	[10-digit phone number]@tmomail.net Example: 1234567890@tmomail.net
US Cellular	[10-digit phone number]email.uscc.net (SMS) Example: 1234567890@email.uscc.net
Verizon	[10-digit phone number]@vtext.com Example: 1234567890@vtext.com
Virgin Mobile USA	[10-digit phone number]@vmobl.com 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
Globalstar (satellite)	number@msg.globalstarusa.com

<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@iwspcs.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>
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<b>Setar Mobile email (Aruba)</b>	<i>297+number@mas.aw</i>
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<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>
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