

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.

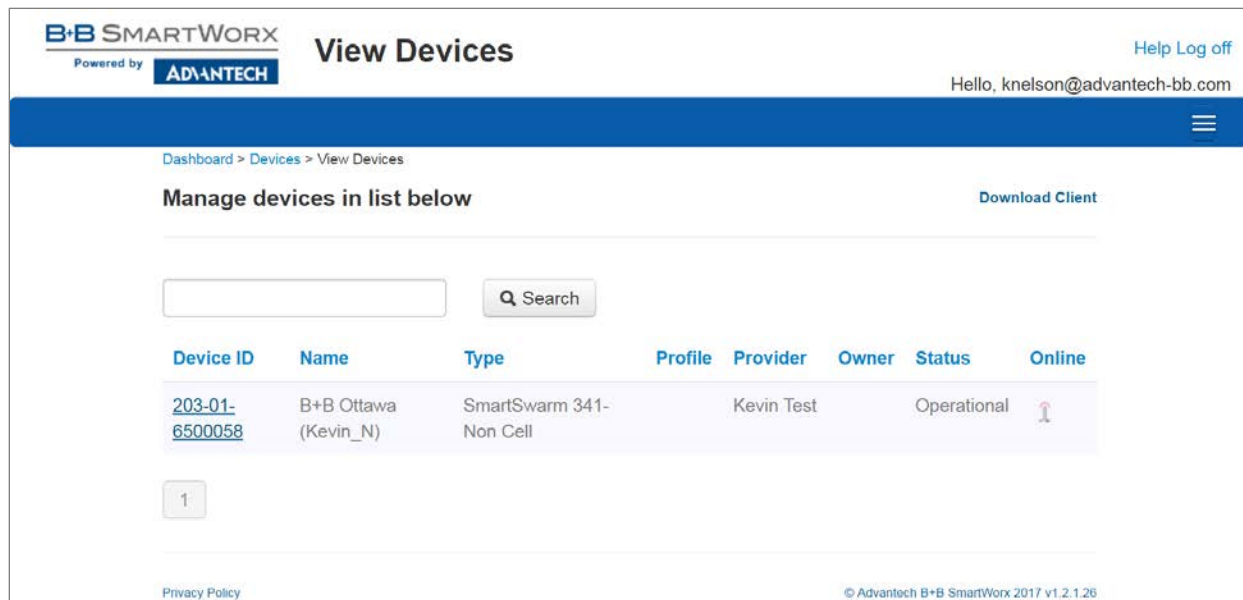
## DOWNLOADING THE HVAC MONITOR NODE RED FLOW TO THE GATEWAY

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:



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 203-01-6500246

Name

Status

Firmware

Device Type SG30000525-41

MAC Address 00:0A:14:85:24:B7

Online ☒

Settings

**Manage Apps**

	Name	Tag	Type	Version	Help	Added
<input type="checkbox"/>	NodeRED	NodeRED	Application	1.0.6		23/06/2017 16:20:39
<input type="checkbox"/>	Components-341	Components-341	Component	1.0.9		23/06/2017 16:20:38
<input type="checkbox"/>	Wzzard	Wzzard	Application	1.0.9		23/06/2017 16:20:39

1

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

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

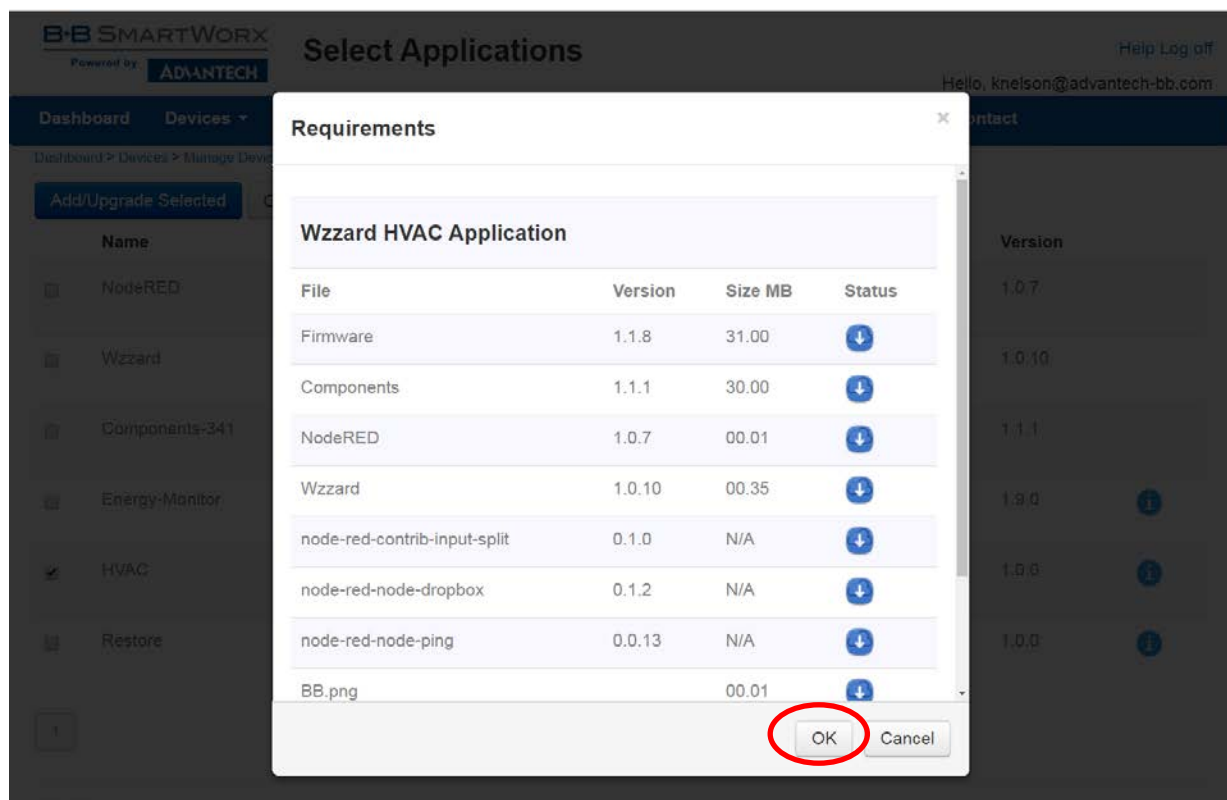
Dashboard Devices Users Technology Providers Configuration Profiles Password Contact

Dashboard > Devices > Manage Device > Select Applications

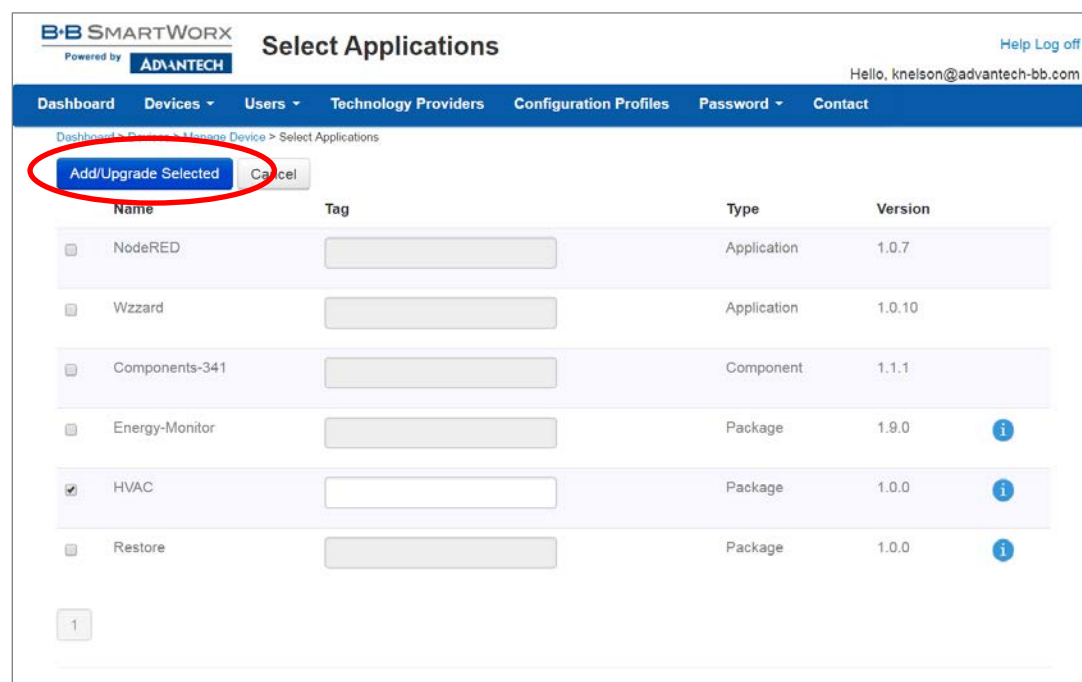
	Name	Tag	Type	Version	
<input type="checkbox"/>	NodeRED	<input type="text"/>	Application	1.0.7	
<input type="checkbox"/>	Wzzard	<input type="text"/>	Application	1.0.10	
<input type="checkbox"/>	Components-341	<input type="text"/>	Component	1.1.1	
<input type="checkbox"/>	Energy-Monitor	<input type="text"/>	Package	1.9.0	<input type="button" value="i"/>
<input checked="" type="checkbox"/>	HVAC	<input type="text"/>	Package	1.0.0	<input type="button" value="i"/>
<input type="checkbox"/>	Restore	<input type="text"/>	Package	1.0.0	<input type="button" value="i"/>

1

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:

**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

The apps have been queued for installation. X

**Device ID** 203-01-6500058


**Name**

**Status**

**Firmware**  [Push](#)


**DeviceType** SG30000520-41

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

**Online** 

**Settings**

[Save](#) [Cancel](#) [History](#) [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](#)

[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

Cancel

← Previous

1

2

3

4

5

Next →

## 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 (1 per second)	Attempting to establish connection with SmartMesh IP network.
	Fast Blink (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.)

Configuration



Wzzard Node Info

BTLE ID:  
0013430F22D5

MESH ID:  
00170D000058D63B

The software will automatically use the IDs of the device.

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

Select Carrier: Select an Option

Enable Text Alerts: ☒ Enter Phone # (no dashes)

Enable Email Alerts: ☒ Enter an Email Address

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

NETWORK HEALTH

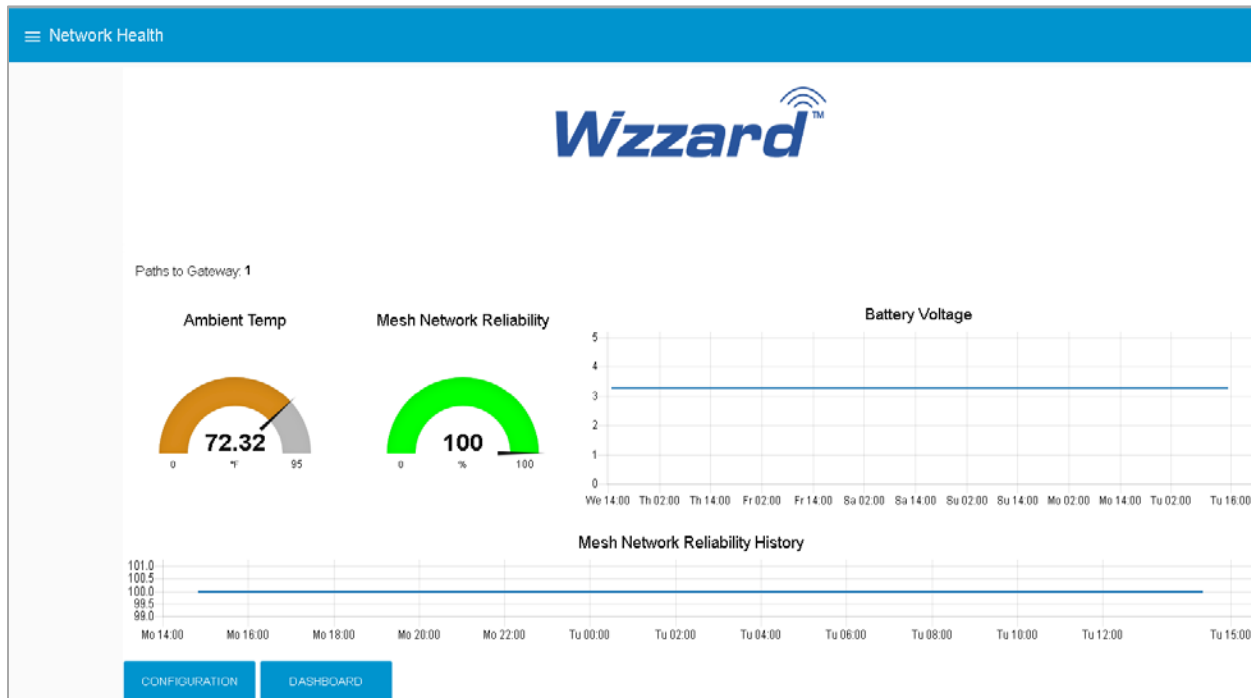
DASHBOARD

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.abcpphone.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.

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## 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.

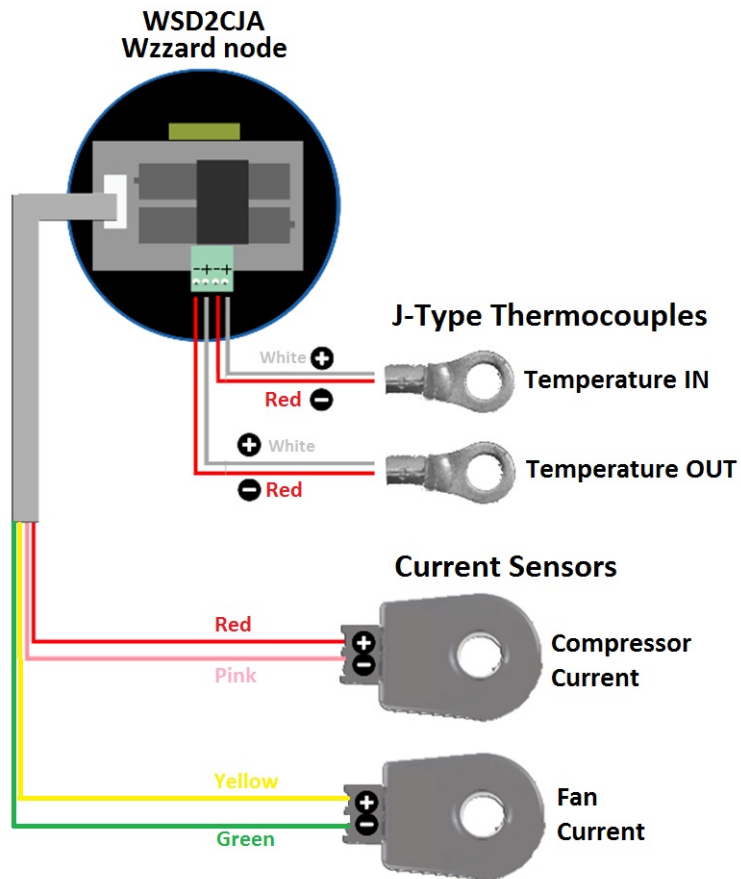


## ATTACHING THE SENSORS ON THE INTELLIGENT EDGE NODES

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

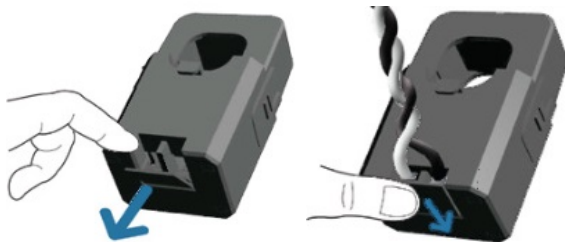
The Wizzard™ HVAC monitoring kit comes with two AC current sensors and two J-Type Thermocouples.

Sensor	Wizzard 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

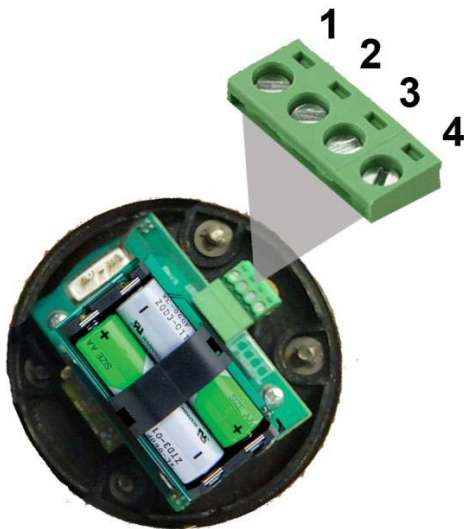


### Current Sensors

- 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.

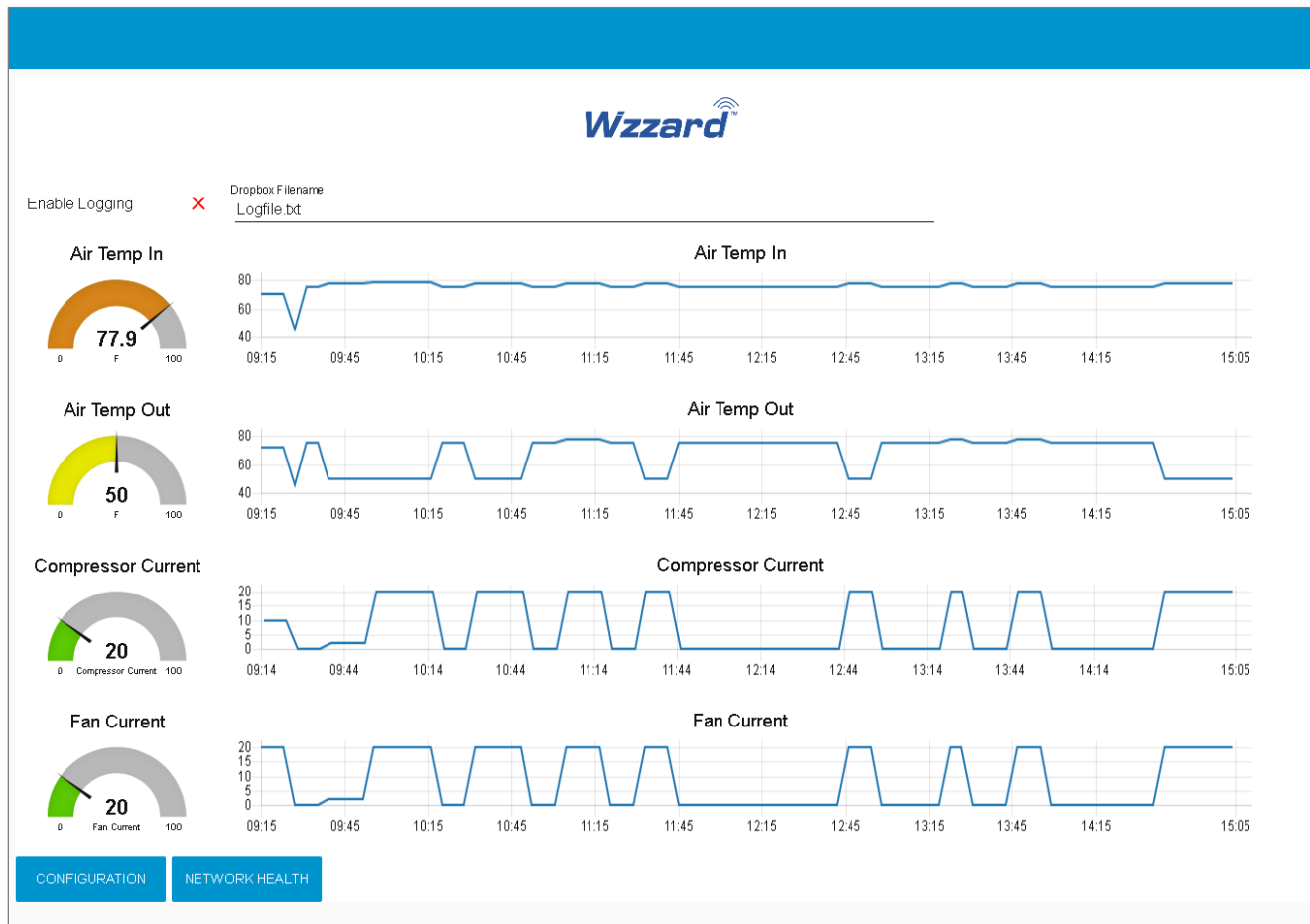
Open the clamp release by pushing it away from the sensor body. Run the wire you are monitoring through the opening in the sensor.



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

## ACCESSING THE DASHBOARD

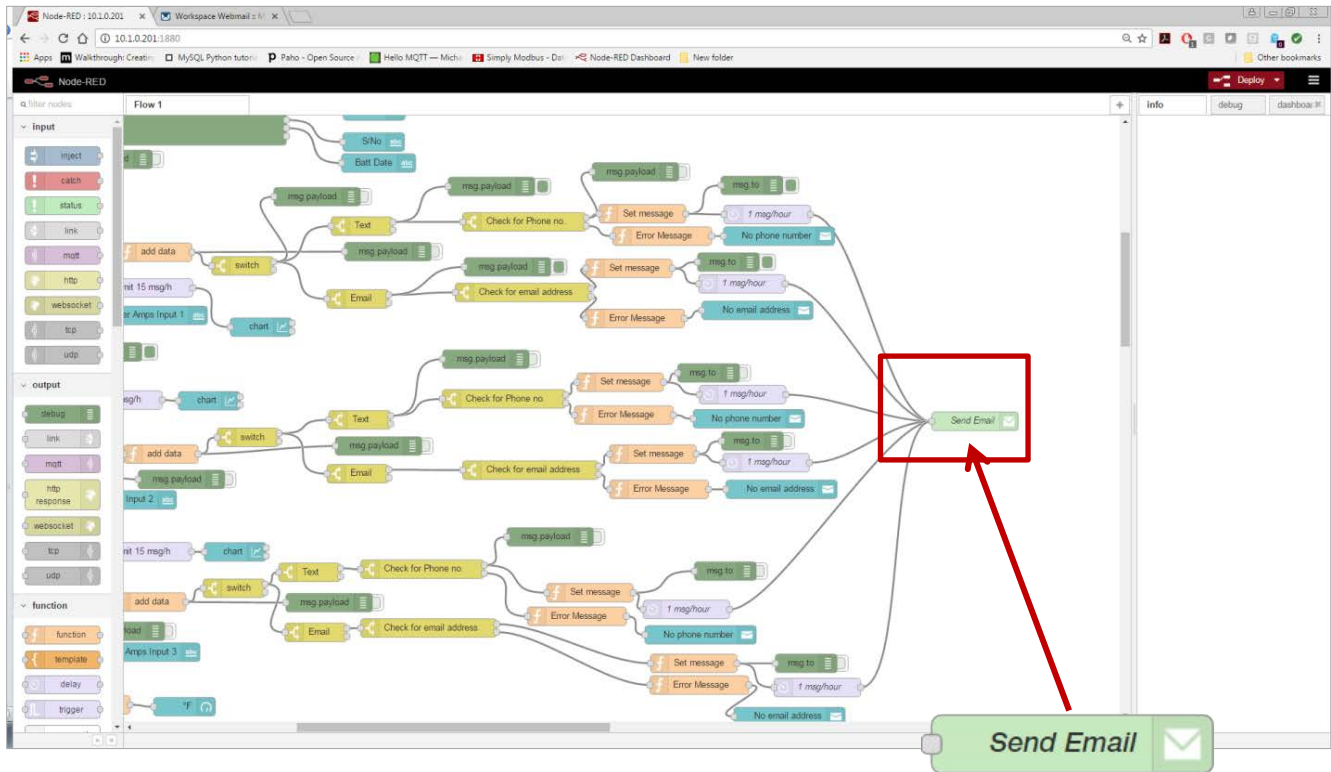
1. Open a browser on your computer and open the Node-RED™ configuration page. The default address is: **192.168.1.1:1880/ui**
2. Click on the “Dashboard” button on the lower left corner of the configuration page.
3. The dashboard should look like the following screen.



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.



The screenshot shows the Node-RED web interface. On the left is a palette of input and output nodes. The main workspace contains a complex flow diagram with various nodes like 'inject', 'switch', 'http', 'websocket', 'tcp', 'udp', 'debug', 'link', 'mqtt', 'http response', 'websocket', 'tcp', 'udp', 'function', and 'template'. On the right, the 'Edit e-mail node' configuration panel is open. It has fields for 'To', 'Server' (smtp.gmail.com), 'Port' (465), 'Userid' (john.doe@gmail.com), 'Password' (masked with dots), and 'Name' (Send Email). A red arrow points to the Password field, and a red box highlights the Server, Port, Userid, and Password fields. A red 'Deploy' button is visible in the top right corner of the interface.

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.

The screenshot shows the Google 'Sign-in & security' settings page. The 'Allow less secure apps' toggle is turned ON. The page also shows 'Saved passwords' and a 'LEARN MORE' link.

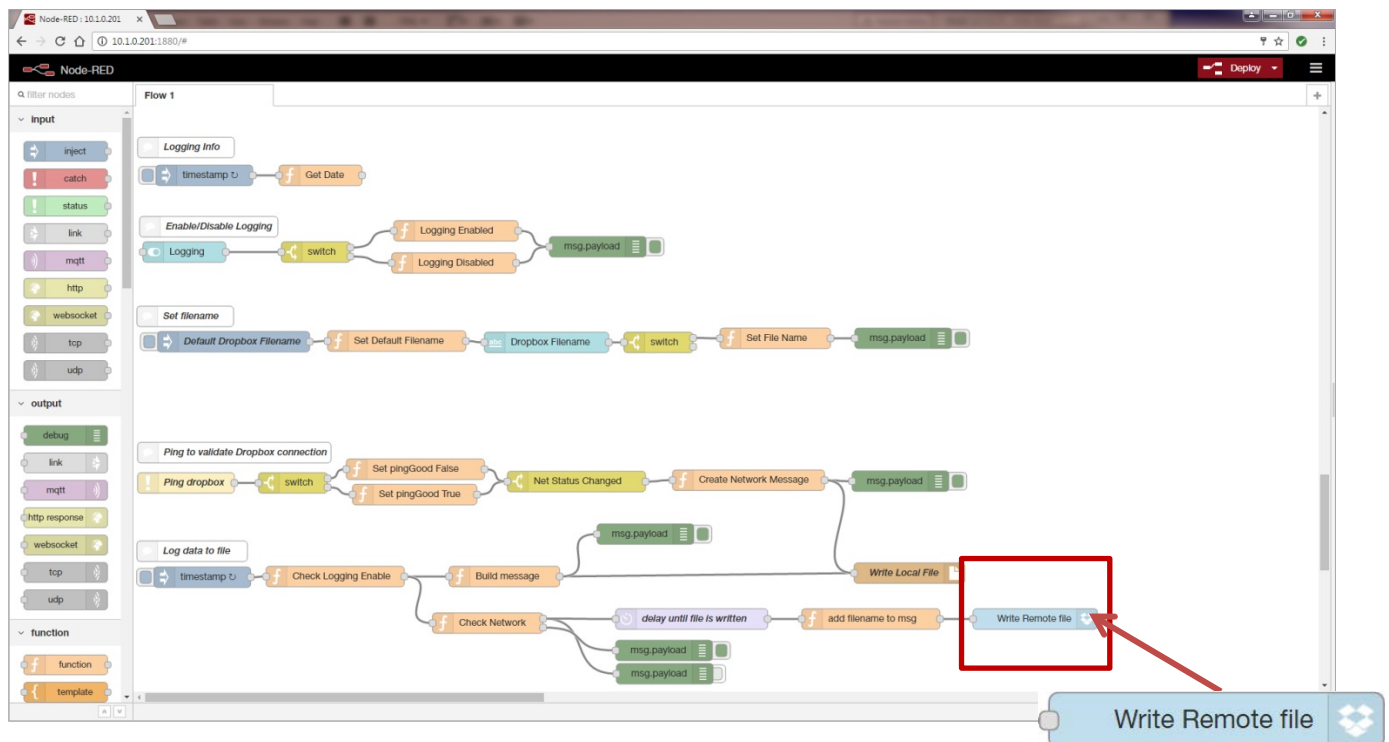
4. Click “Done”. Then Click the “Deploy” button in the upper right corner of the page.

**SETTING UP YOUR DROPBOX FOR LOGGING**

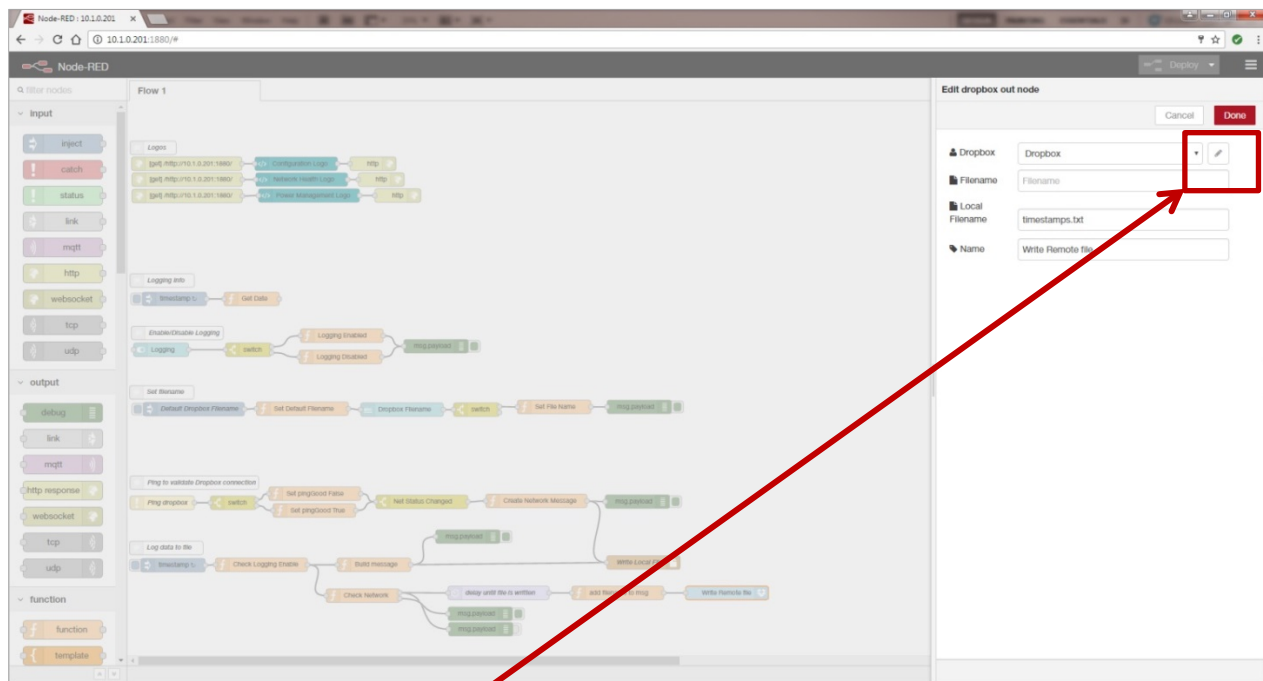
1. Log in to your Dropbox account or sign up for a new one.
2. Once signed up or logged in:
  - Go to <https://www.dropbox.com/developers>
  - Click 'Create your app' box in the center of the screen.
  - Select 'Dropbox API app'.
  - Choose an appropriate answer as to whether your node should be limited 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.

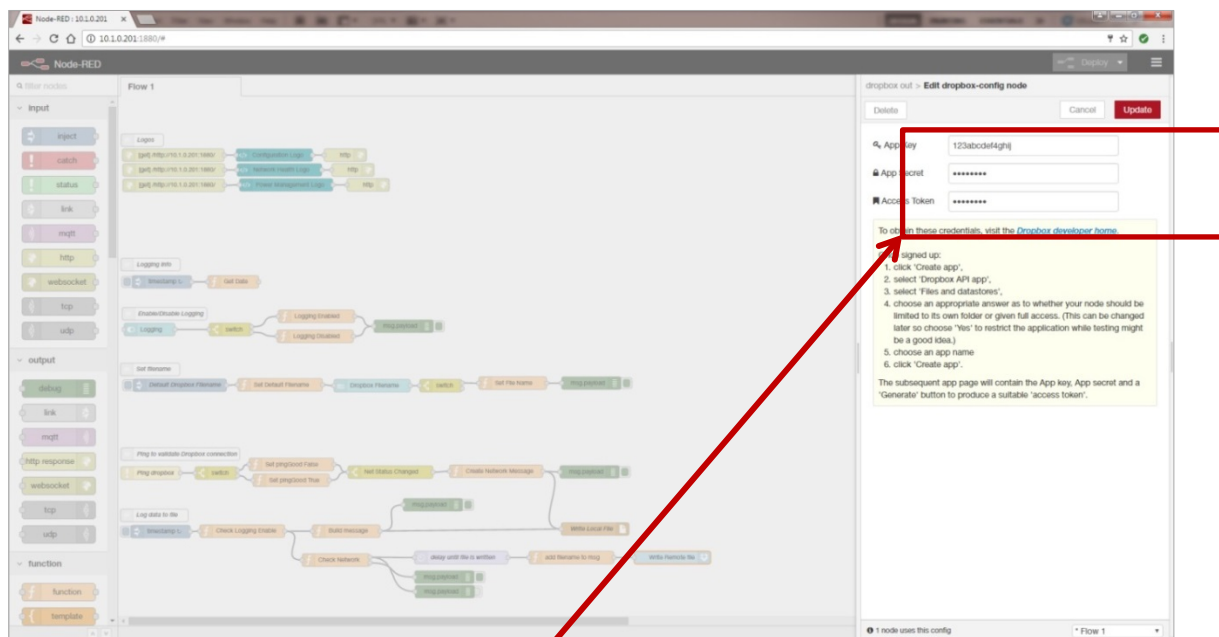
3. From your browser, open the Node-RED™ flow at **192.168.1.1:1880**.



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 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)	<i>number</i> @cingularme.com
Airtel (Karnataka, India)	<i>number</i> @airtelkk.com
Airtel Wireless (Montana, USA)	<i>number</i> @sms.airtelmontana.com
Alaska Communications Systems	<i>number</i> @msg.acsalaska.com
Aql	<i>number</i> @text.aql.com
AT&T Enterprise Paging	<i>number</i> @page.att.net
BigRedGiant Mobile Solutions	<i>number</i> @tachyonsms.co.uk
Bell Mobility & Solo Mobile (Canada)	<i>number</i> @txt.bell.ca
BPL Mobile (Mumbai, India)	<i>number</i> @bplmobile.com
Cellular One (Dobson)	<i>number</i> @mobile.celloneusa.com
Cingular (Postpaid)	<i>number</i> @cingularme.com
Centennial Wireless	<i>number</i> @cwemail.com
Cingular (GoPhone prepaid)	<i>number</i> @cingularme.com (SMS)
Claro (Brasil)	<i>number</i> @clarotorpedo.com.br
Claro (Nicaragua)	<i>number</i> @ideasclaro-ca.com
Comcel	<i>number</i> @comcel.com.co
Cricket	<i>number</i> @sms.mycricket.com (SMS)
CTI	<i>number</i> @sms.ctimovil.com.ar
Emtel (Mauritius)	<i>number</i> @emtelworld.net
Fido (Canada)	<i>number</i> @fido.ca
General Communications Inc.	<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.iws</i> @iwsps.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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You may not use Node-RED software preinstalled in the SmartSwarm Gateway except in compliance with the License. You may obtain a copy of the License at:

**<http://www.apache.org/licenses/LICENSE-2.0>**

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**B+B SMARTWORX TECHNICAL SUPPORT**

**Phone:** 1 (800) 346-3119  
Monday - Friday, 7 a.m. to 5:30 p.m. CST

**Fax:** (815) 433-5109

**Email:** [B+B SmartWorx Technical Support](mailto:B+B SmartWorx Technical Support)

**Web:** <http://www.advantech-bb.com>

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

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