

Wzzard™ Mesh Gen2 Starter Bundles

Energy Monitoring Kit

SETUP MANUAL



B+B SMARTWORX

Powered by

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ENERGY MONITORING STARTER KIT**Kit Model BB-WSK-NRG-2**

The Wzzard™ Mesh Energy 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	BB-WSD2M31010	3 analog-in units with M12 connector and external antenna
Qty 3	BB-JC10F50-V	50A clamp-on current sensor
Qty 1	BB-WSCAM12-6	M12 cable
Qty 1	SmartSwarm 342	Ethernet Gateway with Wzzard Mesh

WZZARD NETWORK SETUP

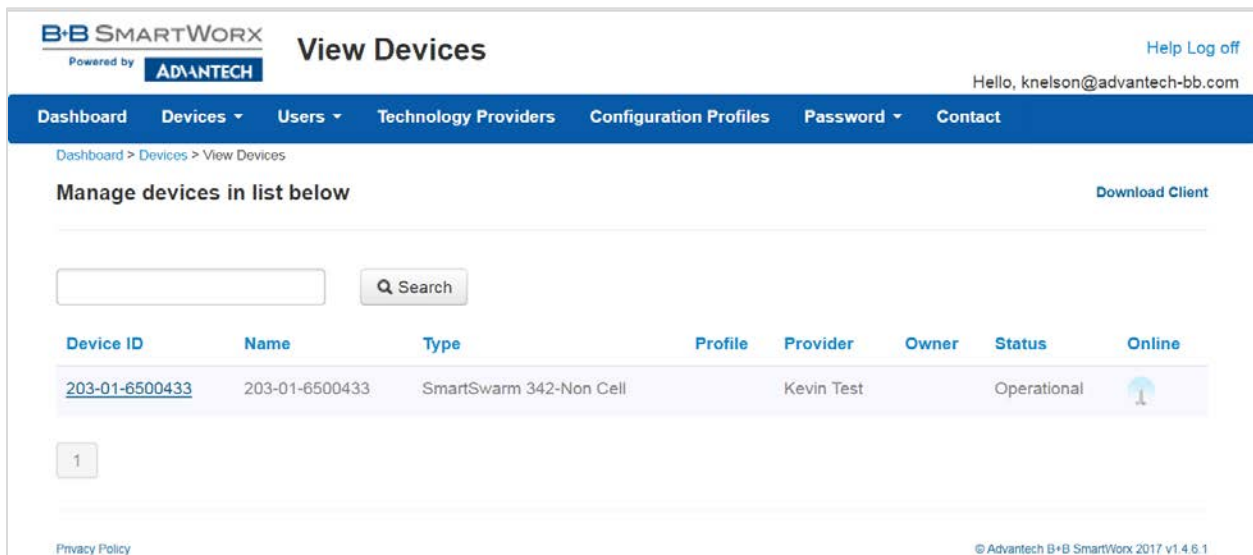
The Wzzard node and gateway in this kit are preconfigured. If this is the only Wzzard device in your vicinity, it will need no further configuration. If other Wzzard gateways or nodes are nearby and unclaimed, you will need to claim the gateway and the node. See respective node and gateway manuals for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

DOWNLOADING THE ENERGY MONITOR NODE-RED™ FLOW TO GATEWAY

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.

The screenshot shows the 'Manage Device' page for a SMARTSWARM 300 device. The device ID is 203-01-6500433, and its name is also 203-01-6500433. The status is 'Operational' and the firmware is '2.2.0'. A 'Push' button is next to the firmware field. The device type is 'SG30000525-42' and the MAC address is '00:0A:14:86:77:C6'. The device is currently 'Online'. A 'Settings' dropdown menu is set to 'Select...'. At the bottom of the device configuration section, there are buttons for 'Save', 'Cancel', 'History', 'Add/Upgrade Apps' (circled in red), 'Geo Location', and 'Wzzard Mesh'. Below this is the 'Manage Apps' section, which includes a 'Remove Selected' button and a table of installed applications.

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

5. Check the box next to **NRG**. 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 'knelson@advantech-bb.com'. 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 'NRG' application is selected, indicated by a red circle around its checkbox. There are also information icons (i) next to the 'HVAC', 'NRG', and 'REF' rows. A page number '1' is visible at the bottom left.

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

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

The screenshot shows the 'Select Applications' interface in the B+B SMARTWORX system. A 'Requirements' dialog box is open, displaying the following table:

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-NRG-2.txt	1.0.1	00.07	↓

Total Download size: 00.15 MB

The 'OK' button at the bottom right of the dialog is circled in red.

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, there is a navigation bar with 'Dashboard', 'Devices', 'Users', 'Technology Providers', 'Configuration Profiles', 'Password', and 'Contact'. Below this is a breadcrumb trail: 'Dashboard > Devices > Manage Device > Select Applications'. The main content area features a table with the following columns: Name, Tag, Type, and Version. The 'NRG' application is selected, indicated by a checked checkbox. The 'Add/Upgrade Selected' button is circled in red.

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 type="checkbox"/> HVAC	<input type="text"/>	Package	1.0.0
<input checked="" type="checkbox"/> NRG	<input type="text"/>	Package	1.0.0
<input type="checkbox"/> REF	<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 web 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 details for a specific device, including its ID, name, status, firmware version, device type, MAC address, and online status. A 'History' button is highlighted with a red circle, indicating the next step in the process.

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

NOTE: If Node-RED™ nodes are current, they will show with an X.

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 17/04/2018 21:03:18

Show entries

Command	Created by	Name	Queued	Completed	Success	Response
UploadConfig	203-01-6500433	2.2.0	17/04/2018 21:01:04	17/04/2018 21:01:04	✓	{"config":{"swm_firewa...
UploadConfig	203-01-6500433	2.2.0	17/04/2018 21:01:01	17/04/2018 21:01:01	✓	{"config":{"swm_firewa...
AddFlow	knelson@advantech-bb.com	NRG	17/04/2018 21:00:59	17/04/2018 21:01:17	✓	Success,[{"9b17f186.f...
GetFlow	knelson@advantech-bb.com	NRG	17/04/2018 21:00:59	17/04/2018 21:01:04	✓	
InstallNewApp	knelson@advantech-bb.com	NRG	17/04/2018 21:00:59	17/04/2018 21:00:59	✓	Completed
GetBinaryFile	knelson@advantech-bb.com		17/04/2018 21:00:59	17/04/2018 21:01:01	✓	
DownloadSettings	knelson@advantech-bb.com	swm_firewall	17/04/2018 21:00:59	17/04/2018 21:01:01	✓	
DownloadSettings	knelson@advantech-bb.com	swm_firewall	17/04/2018 21:00:59	17/04/2018 21:01:00	✓	
DownloadSettings	knelson@advantech-bb.com	Nodes	17/04/2018 21:00:19	17/04/2018 21:00:20	✓	
UploadConfig	203-01-6500433	2.2.0	17/04/2018 20:57:57	17/04/2018 20:57:57	✓	{"config":{"swm_firewa...

Showing 1 to 10 of 58 entries

Cancel

← Previous
1
2
3
4
5
Next →

POINT THE MQTT DATA TO THE INTERNAL MQTT BROKER

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

The screenshot displays the 'Manage Device' page in the B+B SMARTWORX interface. The page header includes the logo and 'Powered by ADVANTECH'. The user is logged in as 'Hello, knelson@advantech-bb.com'. The main navigation bar contains links for Dashboard, Devices, Users, Technology Providers, Configuration Profiles, Password, and Contact. The breadcrumb trail is 'Dashboard > Devices > Manage Device'. The device details section shows the following information:

- Device ID: 203-01-6500433
- Name: 203-01-6500433
- Status: Operational
- Firmware: 2.2.0 (with a 'Push' button)
- Device Type: SG30000525-42
- MAC Address: 00:0A:14:86:77:C6
- Online:
- Settings: Select...

At the bottom of the device details section, there is a row of buttons: Save, Cancel, History, Add/Upgrade Apps, Geo Location, and Wzzard Mesh (highlighted in blue).

The 'Manage Apps' section features a 'Remove Selected' button and 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

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 type="text" value="No"/>
Verify Server Cert:	<input type="checkbox"/>

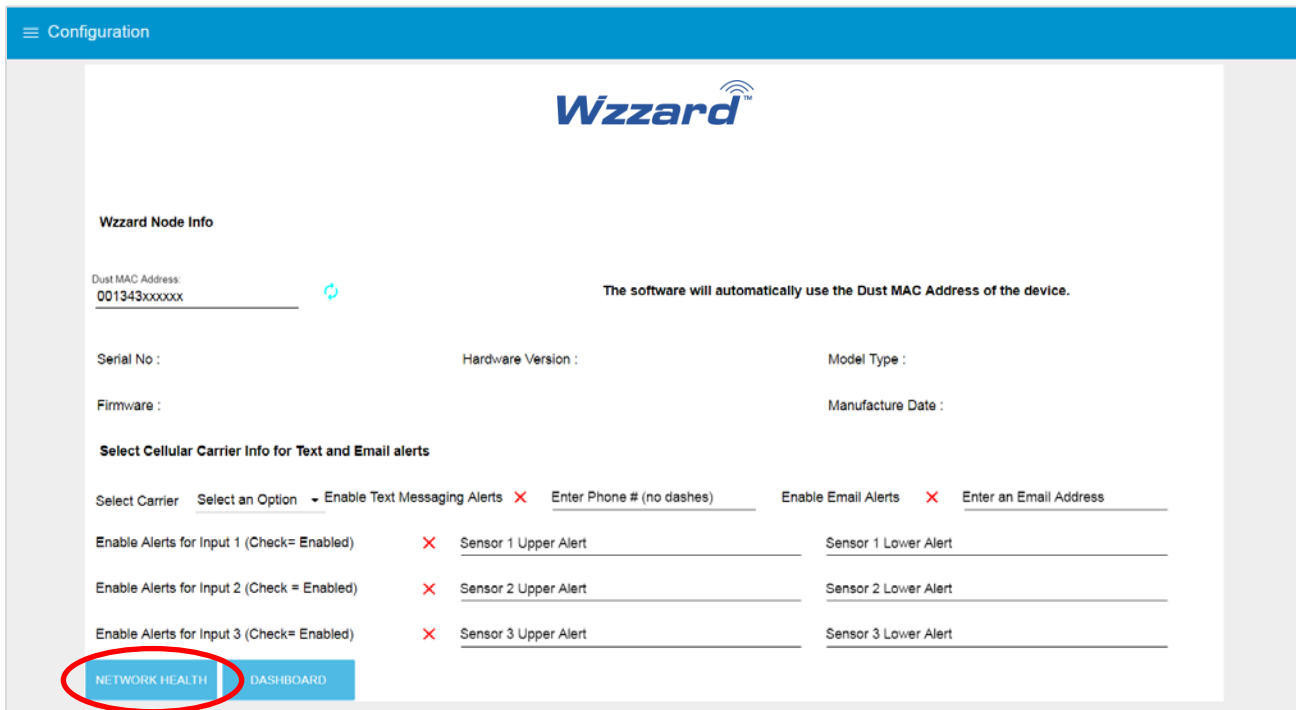
WAKE UP WZZARD™ MESH EDGE NODE

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

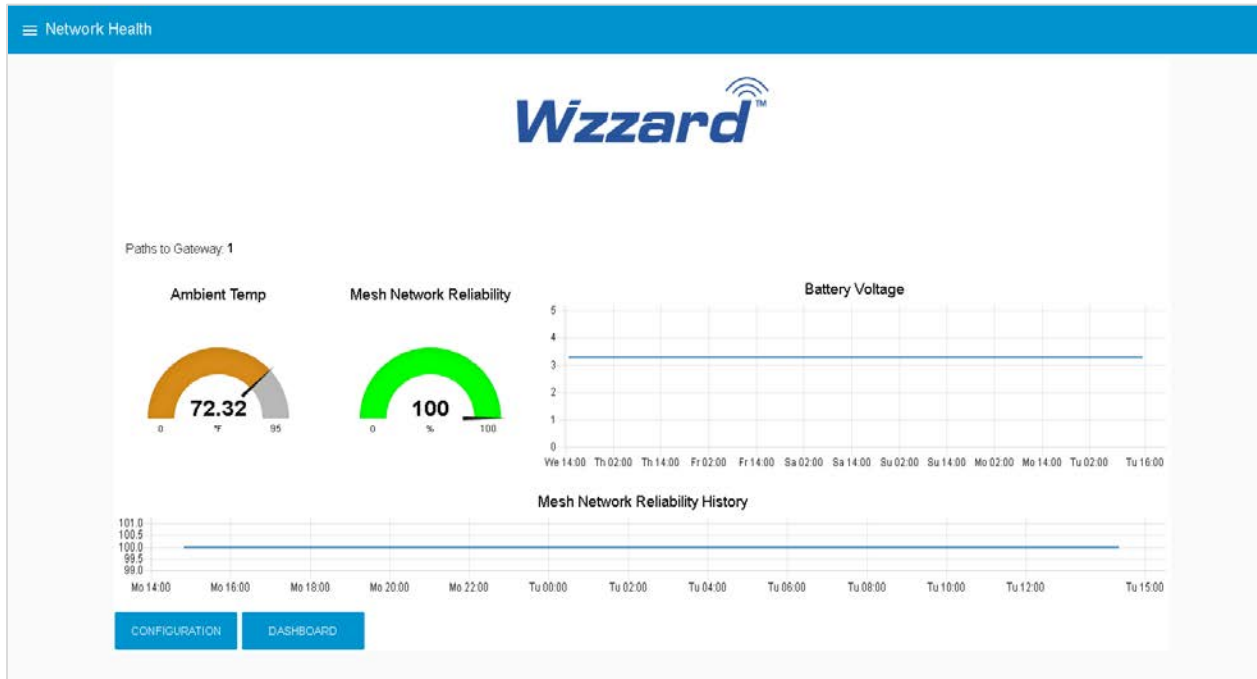
1. Attach the antenna to the Wzzard™ antenna port on the gateway.
2. Attach the Ethernet cable to the ETH port on the gateway and the other end to your PC. You will use an Ethernet connection to configure the gateway and to communicate with it.
3. Attach the supplied power supply and plug it in.
4. Open 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 values on this page will populate when the node joins the network.
6. You can set up a phone number to receive text messages, 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 also 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 (see previous screen). The page below appears. This page shows the status of the network.



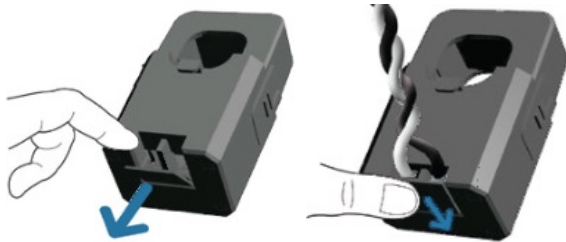
ATTACHING THE SENSORS ON THE INTELLIGENT EDGE NODES

1. Wire Your Sensors.

You can connect up to three sensors to a Wzzard™ mesh node.

Sensor	Wzzard Industrial Node with M12 cable	Wire Color
Sensor 1	Sensor (+) to M12 cable	BROWN
	Sensor (-) to M12 cable	PINK
Sensor 2	Sensor (+) to M12 cable	GREEN
	Sensor (-) to M12 cable	BLUE
Sensor 3	Sensor (+) to M12 cable	YELLOW
	Sensor (-) to M12 cable	RED

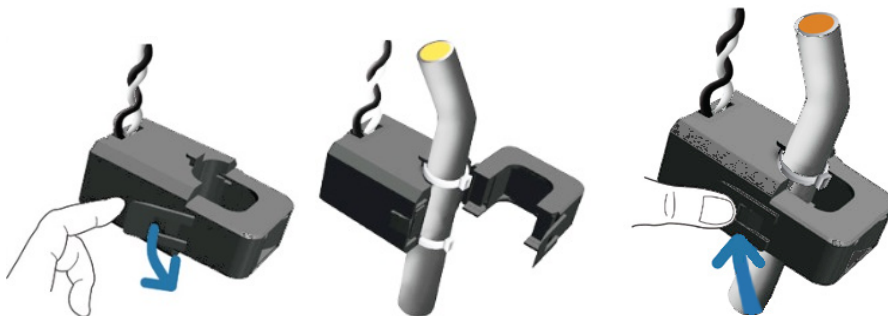
- Open the wire protector clamp by pushing it away from the sensor body.
- Attach your wires.
- Close the wire protector clamp.



2. Mount Your Sensors.

The sensor can be mounted in any position.

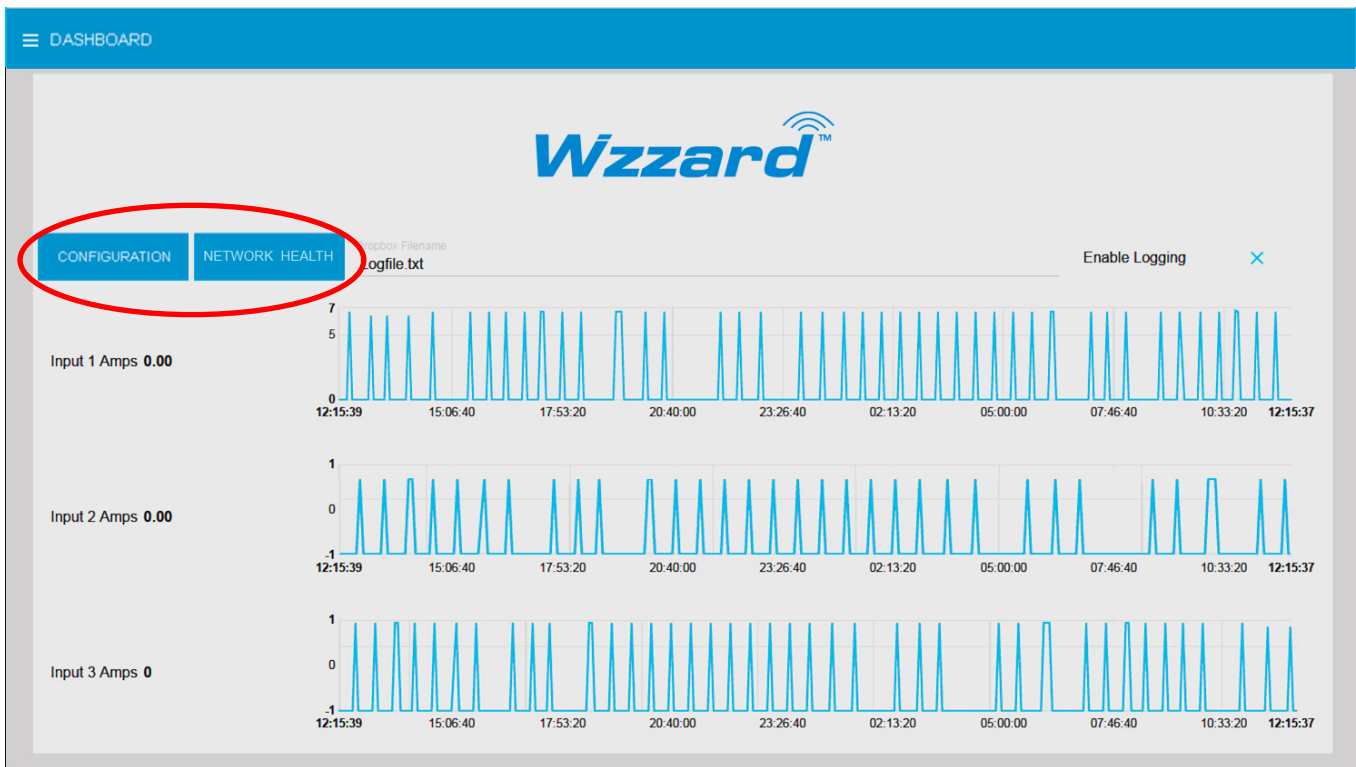
Open the clamp release by pushing it away from the sensor body. Run the wire you are monitoring through the opening in the sensor.



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

ACCESSING THE DASHBOARD

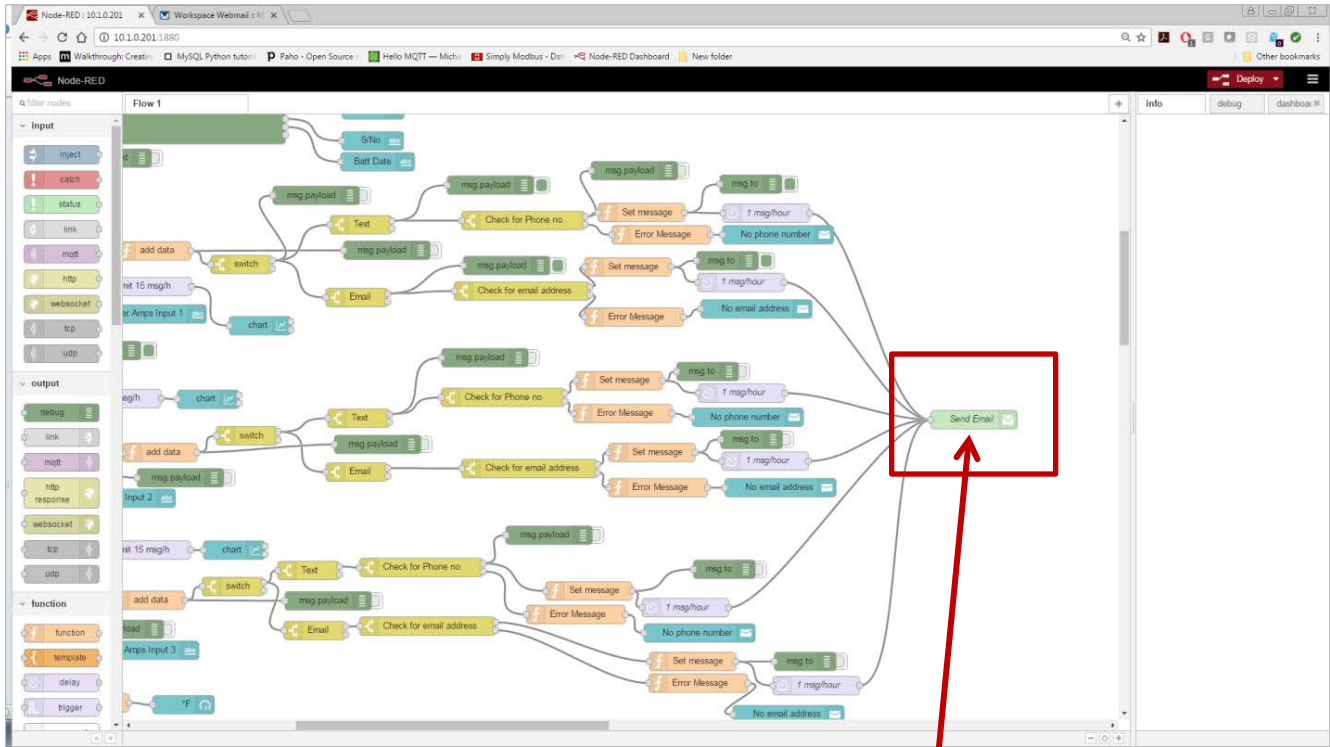
1. Open a browser on your computer and open the Node-RED™ configuration page. The default address is: **192.168.1.1:1880/ui**
2. Click on the **Dashboard** button on the lower left corner of the configuration page.
3. The dashboard should look like the screen below.



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

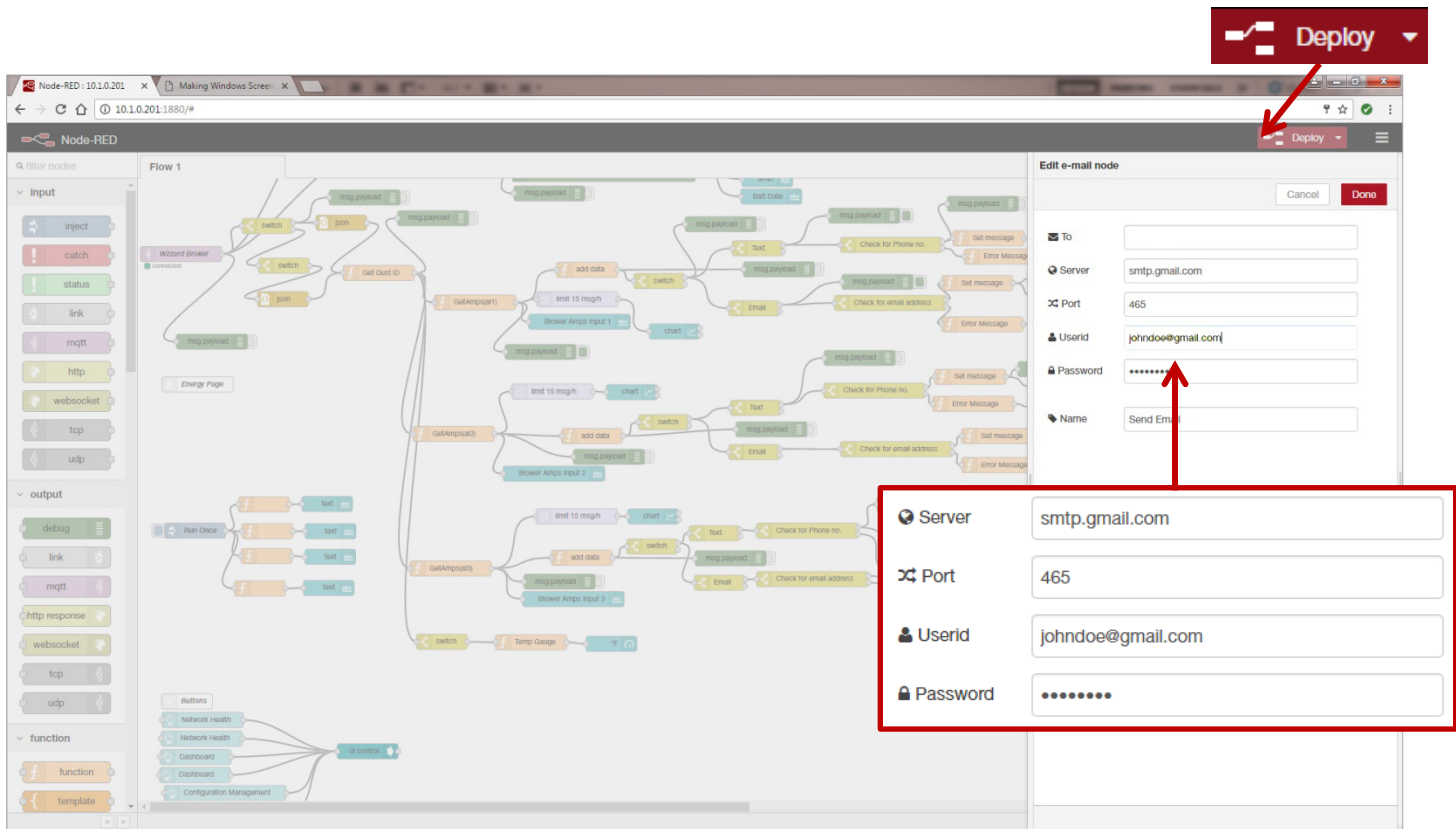
SETTING UP AN E-MAIL ACCOUNT

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



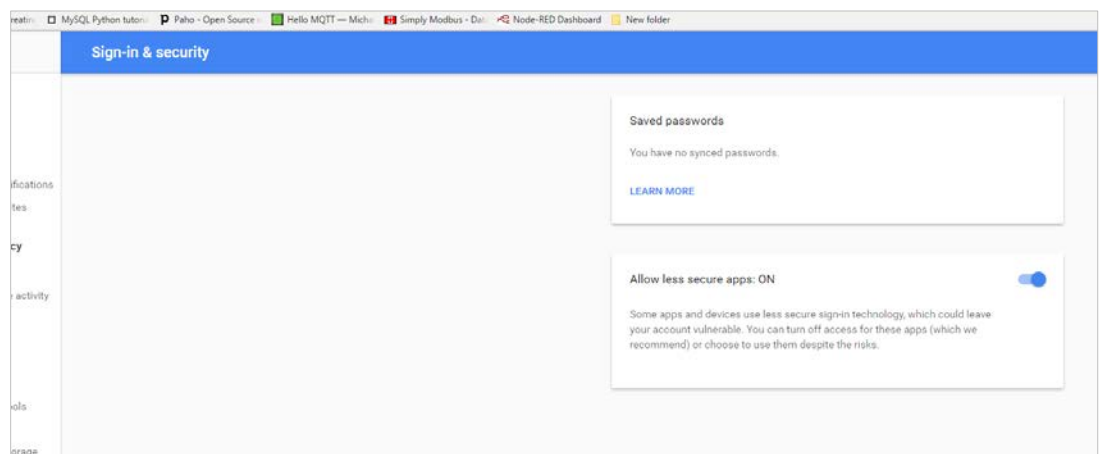
2. Find the **Send Email** node, and double click on it.





3. Enter the Server Address, Port, 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

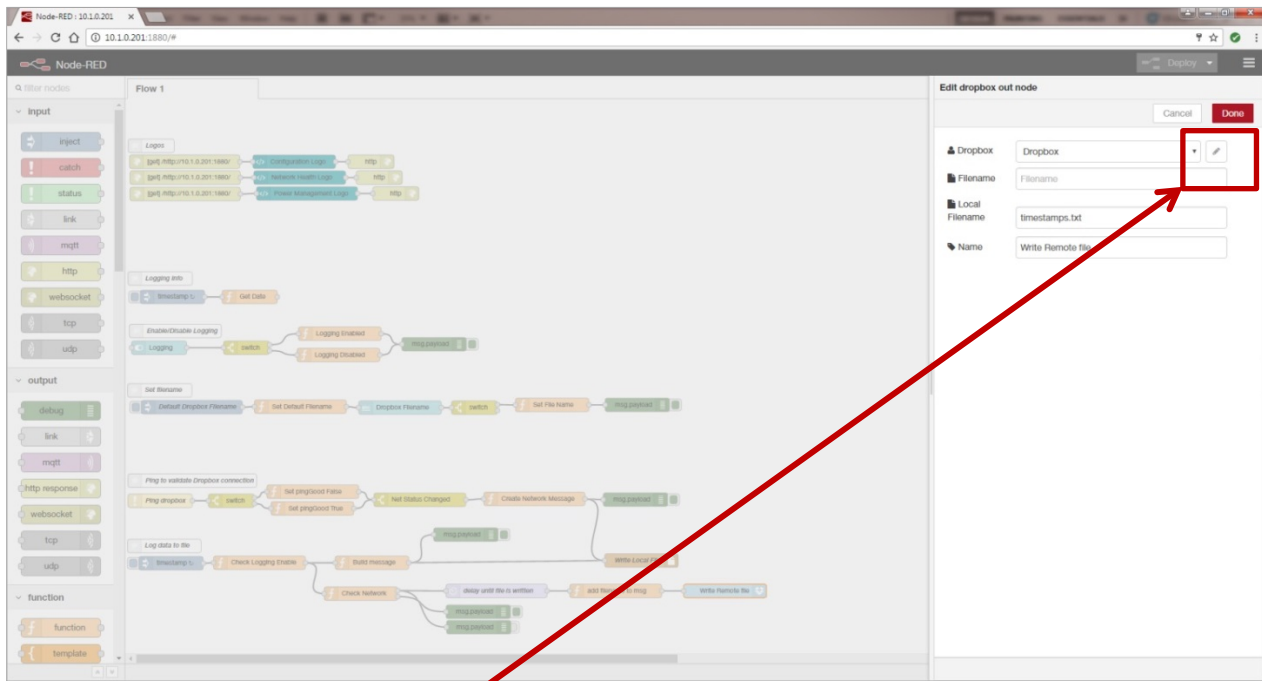
1. Log in to your Dropbox™ account or sign up for a new one.
2. Once signed up or logged in:
 - Go to <https://www.dropbox.com/developers>
 - Click **Create your app** box in the center of the screen.
 - Select **Dropbox API app**.
 - Choose an appropriate answer as to whether your node should be limited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

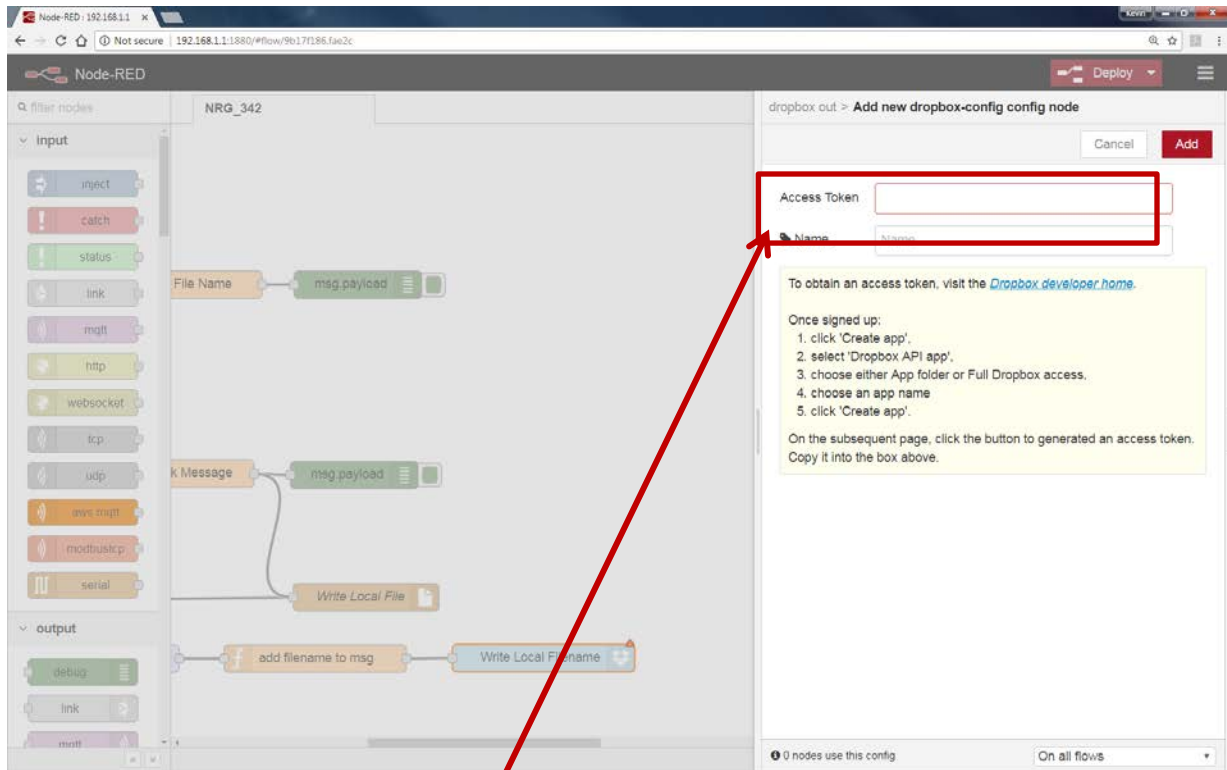
3. From your browser, open the Node-RED™ flow at **192.168.1.1:1880**.

The screenshot shows the Node-RED interface with a flow titled 'NRG_342'. The flow is organized into several sections: 'Input', 'Set filename', 'Ping to validate Dropbox connection', 'Log data to file', and 'Logos'. The 'Log data to file' section is the most complex, involving a 'timestamp tv' node, a 'Check Logging Enable' function node, a 'Build message' function node, a 'Write Local File' node, a 'Check Network' function node, a 'delay until file is written' node, an 'add filename to msg' function node, and a 'Write Local Filename' node. A red box highlights the 'Write Local Filename' node in the flow, and a callout box with a red arrow points to it from the bottom right.

4. Double click on the blue **Write Local Filename** node.



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 **Done**, 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.

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

Node-RED™ SOFTWARE LICENSE

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