SmartSwarm 341
Quick Start Guide

1. Introduction

The SmartSwarm 341 IIoT gateway provides on-site management, aggregation, filtering and business logic for data recovered from a network of connected WZZARD wireless mesh nodes. It provides a Node-RED graphical user applications programming environment which can process data from multiple sources to produce a real-time data feed from the local asset into IIoT applications such as dashboarding, analytics or predictive maintenance, as well as providing local dashboarding and direct communications via email etc.

Safety

• Use the device in compliance with national and international law and in compliance with any special or additional restrictions regulating use of the Advantech B+B SmartWorx device in specific applications and environments.

• Use only the original accessories as provided by Advantech B+B SmartWorx. Using unapproved accessories can result in device damage, warranty termination, and/or violation of legal regulations.

• Unauthorized device or accessory modification can result in device damage, warranty termination, and/or violation of legal regulations.

• Do not open the device.

• When connecting the device to a power supply do not exceed the defined voltage.

• Do not expose the device to extreme ambient conditions. Protect the device against dust, moisture, and high temperature.

CE We declare that the SmartSwarm 341 (except for versions SG300) is in compliance with the essential requirements and other relevant provisions of directive 1999/5/EC. SmartSwarm 341 versions SG300 are in compliance with the essential requirements and other relevant provisions of directive 2014/30/EU and 2014/35/EU. The Declaration of Conformity is available on the company website or from technical support, on request.

Product Disposal

The WEEE (Waste Electrical and Electronic Equipment: 2002/96/EC) directive has been introduced to ensure that electrical/electronic products are recycled using the best available recovery techniques to minimize the impact on the environment. This product contains high quality materials and components which can be recycled. At the end of its life this product MUST NOT be mixed with other commercial waste for disposal. Check with the terms and conditions of your supplier for disposal information.

2. Connect Antennas

Connect a 2.4GHz antenna to the connector marked 'WZZARD.'

If required, and if you have a cellular enabled version of the SmartSwarm 341, connect the main cellular antennas to the device by screwing them into the ANT and DIV connectors.

3. Install SIM Card

If you intend to use this device to communicate over a cellular network, place an activated data-provisioned SIM card into the SIM1 card reader.

NOTE: SIM2 is not currently supported.

4. Connect Power

The device requires between +10 to +60 VDC power. 4W typical; 11 W peak.

5. Connect Ethernet

An Ethernet cable may be connected to the ETH0, and/or ETH1, connectors on the front panel. By default, the Ethernet ports are configured as follows:

PORT	PURPOSE	DEFAULT SETTING
ETH0	LAN port (default) Connect your laptop or PC to get a local web-server for device configuration and diagnostics.	**DHCP Server** **IP Address:** 192.168.1.1 **NetMask:** 255.255.255.0
ETH1	WAN port (default) Connect this port to your WAN to allow the device to obtain access to the remote device management service, SmartWorx Hub, over Ethernet.	**DHCP Client:** The device will automatically obtain an IP address from your DHCP server.

6. Configuration

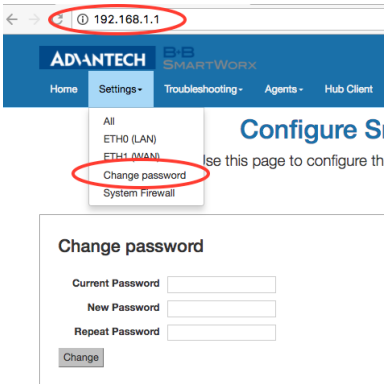
By default, the device will make a secure connection to the cloud-hosted device management service: SmartWorx Hub. ***https://hub.bb-smartworx.com***

This will automatically happen if there is an outbound WAN connection available via ETH1, with a route to the public Internet.

ALTERNATIVELY, you may want to use cellular. This requires a valid SIM card in SIM Slot 1.

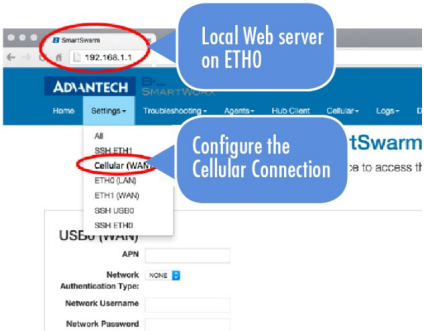
In order to configure the cellular connection, connect your laptop or PC directly into ETH0, then point your web browser at **192.168.1.1**.

You will be prompted to sign in: the **default password is "5mart5warm"**.
We recommend that you change this default password after you login for the first time.



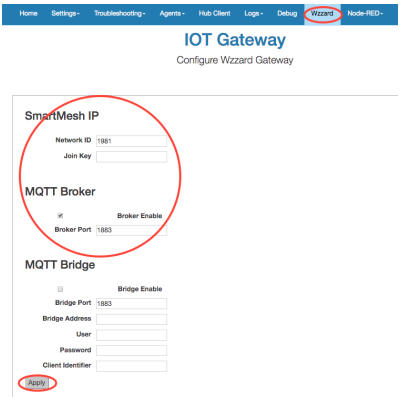
Enter the APN name and optional credentials, as required by your SIM card provider / network operator.

The WAN LED will turn ON (yellow) when the cellular connection has been successfully established.



6.1 Mesh with Wzzard Sensor Nodes

By default, the mesh Network ID is set to 1981, and the Join Key is left blank. This corresponds to the **default settings used in the WZZARD** wireless sensor nodes: If everything is left in default configuration, then a new Wzzard node simply needs to be powered up in order for it to find and join the mesh network.



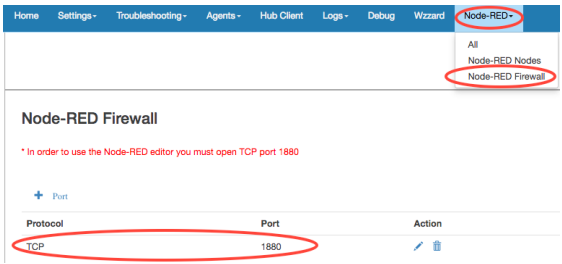
NOTE if multiple gateways are used in the same area, configured with the same Network ID and join key, then new Wzzard nodes will connect to the first gateway they find. If you have more than one Gateway, please ensure all your Gateways are **using different Network IDs,** and **configure your WZZARD sensor nodes accordingly.**

Please refer to your WZZARD documentation for information on how to configure the WZZARD sensor nodes.

6.2 Node-RED

The SmartSwarm 341 runs a Node-RED programming environment by default.

In order to access this environment from your web-browser, you will need to open TCP port 1880 within the Node-RED containerised-application firewall.



Now, to access the Node-RED programming environment, point your browser at:
192.168.1.1:1880

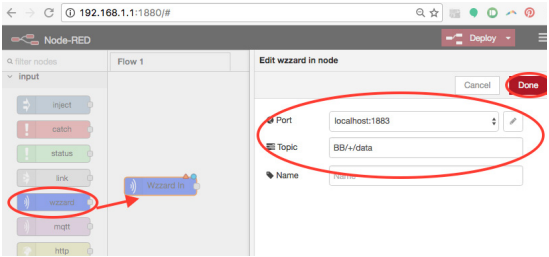
Note that port 1880 has been opened on all interfaces. So you may alternatively access Node-RED via ETH1, using the WAN IP Address that has been assigned to ETH1.

6.3 Getting Data from Wzzard into Node-RED

From the Node-RED Palette, select the “wzzard” input Node, and drag it onto the editor canvas.

Double-click on it to configure it.
By default, the Port will be 1883. Do not change this.

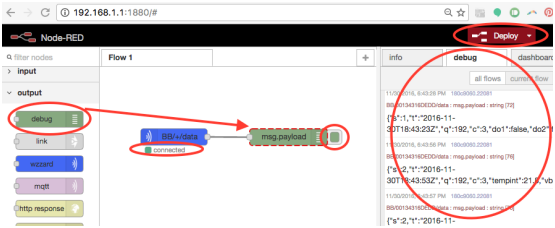
In the Topic field, enter: **“BB/+/data”**, then click DONE.
This will subscribe to all Data that is being published by all of the WZZARD sensor nodes that are available on the current WZZARD MESH network.



From the Node-RED Palette, select the “debug” output node, and drag it onto the editor canvas. Join up the “wzzard” node to the “debug” node.

Deploy this Node-RED Flow.
You should see that the “wzzard” node is now “connected”.

Turn on Debug output.
Now, you can verify that you are receiving Data from your WZZARD sensor nodes in the “debug” panel in the side-bar.

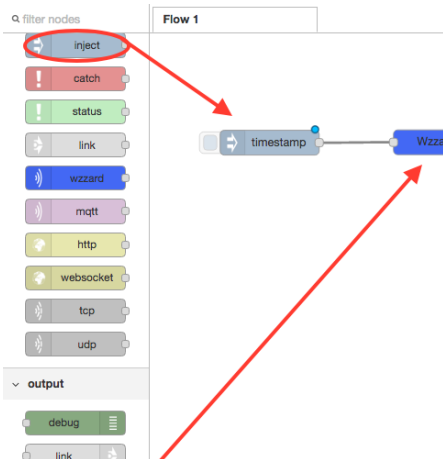


6.4 Push Config-Data to Wzzard from Node-RED

It is possible to use the Node-RED environment to push configuration data out to the WZZARD sensor nodes.

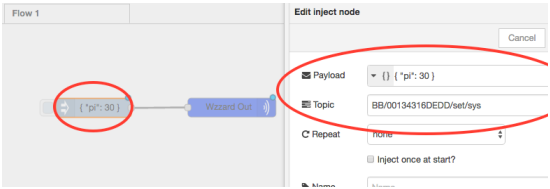
If you choose to use this option, you will need to know the WZZARD Topic Space and Data Formats required. Please refer to your WZZARD documentation.

For example:
If you wish to change the Publish Interval of one of your WZZARD sensor nodes, select the “inject” input node, and the “wzzard” output node, and drag them both onto the Canvas.

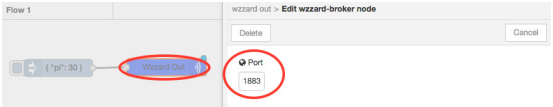


Edit the “inject” node: select JSON as the payload type and enter the string **{ “pi”:30 }** to configure a 30 second Publish Interval.

Enter **BB/WZZARD_BTLE_ID/set/sys** into the Topic field: Replace the text “WZZARD_BTLE_ID” with the actual 12 character BTLE ID of the WZZARD sensor node you want to set.

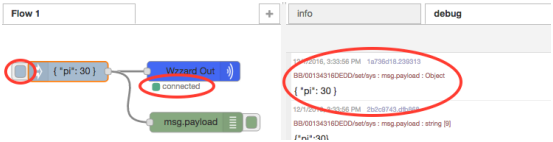


Edit the “wzzard” output node. Confirm port 1883, and Update.



Deploy this Flow.

Now, when you push the “inject” input button on the “inject” node in the flow, the Publish Interval for your WZZARD sensor node will be changed to 30 seconds.
You can confirm, using the “debug” output node, as before.

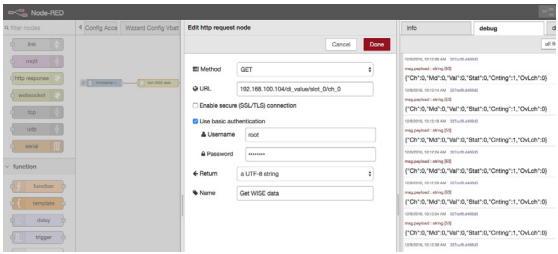


6.5 Getting Data from ADAM/WISE into Node-RED

SmartSwarm 341 can interact with ADAM 6000 and WISE 4000 series I/O modules using their REST interface. As an example, the following describes how to set up simple interaction with a WISE 4000 series device. NOTE that the command structure for ADAM differs to that for WISE, and the URL and payload details below will not work with an ADAM device. Refer to the WISE/ADAM manual for a full description of the available command methods and data formats.

From the Node-RED pallete, drag down an inject node and http request node and link them together. The inject node should be configured to repeat at the interval you wish to recover data. The Payload content is not important as it is just providing a trigger. The http request node should be configured for a GET method, and the URL should be set to the IP address and REST query needed to extract the relevent data. For example:

192.168.100.104/ai_value/slot_0/ recovers all AI data from a unit at 192.168.100.104
192.168.100.104/ai_value/slot_0/ch_0 recovers just AI 0 data
192.168.100.104/di_value/slot_0/ recovers all DI data from a unit at 192.168.100.104
192.168.100.104/di_value/slot_0/ch_0 recovers just DI 0 data



Basic authentication should be selected with username = ‘root’ and Password = ‘00000000’ to match the defaults for the ADAM/WISE unit.

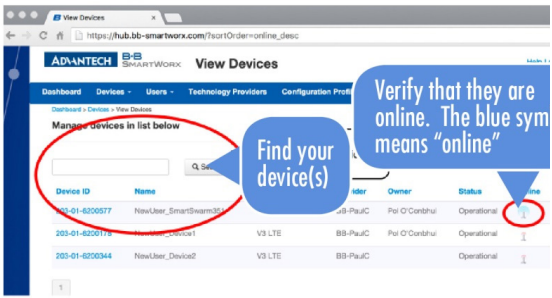
7. Remote Configuration Using SmartWorx Hub

The USR LED will turn on (yellow) when the device successfully makes a secure connection with SmartWorx Hub (https://hub.bb-smartworx.com).

The SmartSwarm 341 can be configured remotely via the SmartWorx Hub cloud-hosted device management service. To access this service, go to:
https://hub.bb-smartworx.com

If this is your first time accessing this service, you will need a SmartWorx Hub account. Contact your device supplier to arrange this. If you have an account, please login to claim and manage your devices.

In order to verify the installation, please check that the device is shown as “Online” in SmartWorx Hub:



8. Factory Defaults

The unit may be reset to Factory Defaults at any time by pressing the Reset button on the back-panel of the device for more than 10 seconds.

9. Additional Documents

The User Manual for the SmartSwarm 341 can be found on the company web site:
http://advantech-bb.com/product-technology/iot-and-network-edge-platforms/smartswarm

10. LEDs

LED	COLOR	STATE	DESCRIPTION
PWR	Green	Off	No power
		On	Device is booting
		Blinking	Device is in normal operating mode
		Fast Blinking	Device is updating firmware. Do not power off
USR	Yellow	Off	The device does not have a working session established with SmartWorx Hub
		On	The device has a working secure session established with SmartWorx Hub
PoE	n/a	n/a	Not Used
Wzzard Status	Yellow	Off	The Wzzard App on the Gateway is either not installed or not running.
		On	The Wzzard App is installed and running.
		Blinking	There is communication in progress on the DUST mesh network
DAT	Red	Off	There is no communication on the cellular interface at this moment
		Blinking	There is communication in progress on the cellular interface
SIM	Green	Off	Reset button pressed or the device is booting
		On	Ready for operation. SIM 1 is enabled
WAN	Yellow	Off	There is no cellular connection between the Gateway and the cellular service provider
		On	A cellular connection has been successfully established between the Gateway and the cellular service provider
IN0	Green	Off	A cellular connection has been successfully established between the Gateway and the celllular service provider
		On	The default state
IN1	Green	Off	Binary input no. 0 is active (user defined)
		On	Binary input no. 1 is active (user defined)
Out	Yellow	Off	The default state
		On	Binary output is active (user defined)
ETH0 ETH1	Green	On	10 Mb/s
		Off	100 Mb/s
ETH0 ETH1	Yellow	On	The network cable is not connected
		Off	Network cable is connected
		Blinking	Data transmission in progress

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