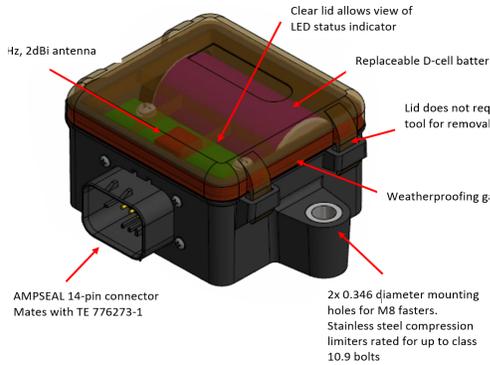


# MicroStrain SG-Link-200 Wireless Analog Input Node

## Quick Start Guide

The SG-Link®-200 is a 3-channel wireless sensor with a rugged, weatherproof enclosure. It includes onboard PGA, filtering, and a high-resolution ADC for precise measurement of a large range of sensor types including strain gauges, load cells, pressure transducers, and accelerometers. The SG-Link-200 is ideal for both test and measurement and long term condition monitoring applications.

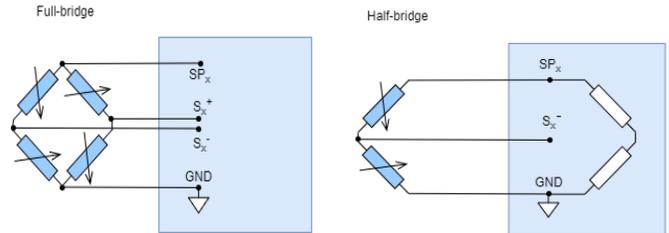


Use this document to deploy the SG-Link-200 for data collection. This includes electrical wiring, mounting the device, and using SensorConnect software to configure the node, start sampling, and display data.

Indicator	Behavior	Node Status
Device Status Indicator	OFF	Node is Off
	Rapid green flashing on startup	Node is booting up
	1 slow green pulse per second	Node is idle and waiting for a command
	1 green blink every 2 seconds	Node is sampling
	Blue LED during sampling	Node is resynchronizing
	Red LED	Built in Test error

Indicator Behaviors

### Pinout and Sensor Wiring



Pin #	Name	Description	Pin Type	Range	Optional Cable
1	VIN	External supply voltage	Power input	4.0 to 36 V	Red
2	GND	Ground	Power return	GND	Black
3	SP	Sensor Excitation Voltage On continuously or duty cycle to the sensor to save power	Analog Output	1.5V/2.5V (100 mA)	White
4	SP	Sensor Excitation Voltage On continuously or duty cycle to the sensor to save power	Analog Output	1.5V/2.5V (100 mA)	White
5	SP	Sensor Excitation Voltage On continuously or duty cycle to the sensor to save power	Analog Output	1.5V/2.5V (100 mA)	White
6	S3+	Channel 3 Sensor Input + (Full-bridge only)	Analog Input	0 to 2.5 V	Purple
7	S2-	Channel 2 Sensor Input -	Analog Input	0 to 2.5 V	White, yellow stripe
8	GND	Sensor Ground	GND	GND	White, green stripe
9	S1+	Channel 1 Sensor Input + (Full-bridge only)	Analog Input	0 to 2.5 V	Blue
10	S3-	Channel 3 Sensor Input -	Analog Input	0 to 2.5 V	White, purple stripe
11	GND	Sensor Ground	GND	GND	White, green stripe
12	S2+	Channel 2 Sensor Input + (Full-bridge only)	Analog Input	0 to 2.5 V	Yellow
13	S1-	Channel 1 Sensor Input -	Analog Input	0 to 2.5 V	White, blue stripe
14	GND	Sensor Ground	GND	GND	White, green stripe

Table 1. SG-Link-200 Full and Half-Bridge Pinout Descriptions with Optional Cable Colors

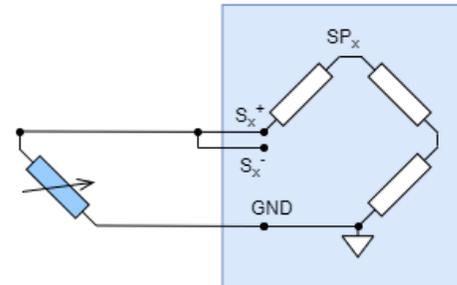


# SG-Link-200 Quick Start Guide

## Pinout and Sensor Wiring

Pin #	Name	Description	Pin Type	Range
1	VIN	External supply voltage	Power input	4.0 to 36 V
2	GND	Ground	Power return	GND
3	NC	No Connect	--	--
4	NC	No Connect	--	--
5	NC	No Connect	--	--
6	S3+	Channel 3 Three-wire excitation. Sensor excitation for three wire configuration of quarter bridge strain gauges. Short to S3- when using two-wire configuration.	Analog Output	0 to 2.5 V
7	S2-	Channel 2 Sensor Input	Analog Input	0 to 2.5 V
8	GND	Sensor Ground	GND	GND
9	S1+	Channel 1 Three-wire excitation. Sensor excitation for three wire configuration of quarter bridge strain gauges. Short to S1- when using two-wire configuration.	Analog Output	0 to 2.5 V
10	S3-	Channel 3 Sensor Input	Analog Input	0 to 2.5 V
11	GND	Sensor Ground	GND	GND
12	S2+	Channel 2 Three-wire excitation. Sensor excitation for three wire configuration of quarter bridge strain gauges. Short to S2- when using two-wire configuration.	Analog Output	0 to 2.5 V
13	S1-	Channel 1 Sensor Input	Analog Input	0 to 2.5 V
14	GND	Sensor Ground	GND	GND

Quarter-bridge, 2-wire



Quarter-bridge, 3-wire

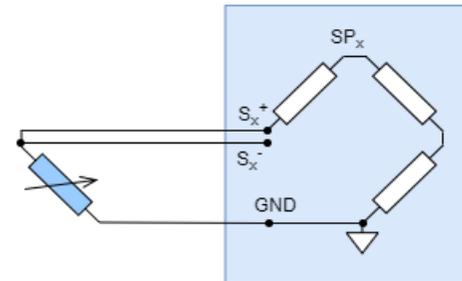
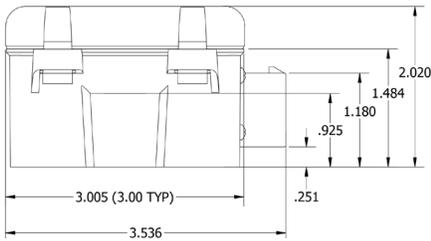
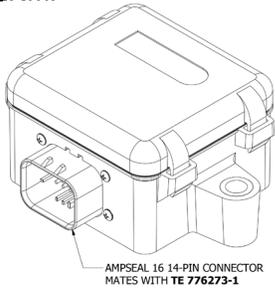


Table 2. SG-Link-200 Quarter Bridge Pinout Descriptions with Optional Cable Colors

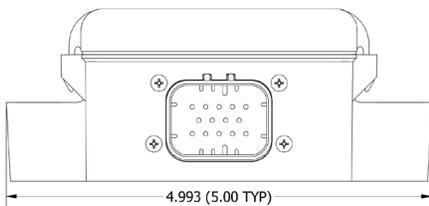
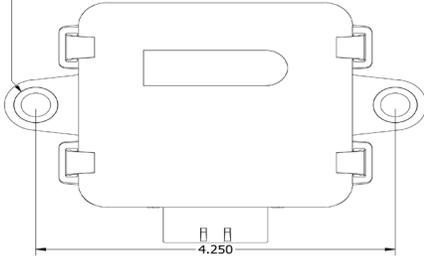
# SG-Link-200 Quick Start Guide

## Mounting Recommendations

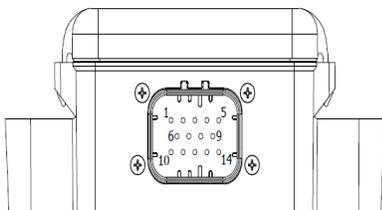
The SG-Link-200 may be mounted using the holes sized for M8 fasteners. Stainless steel compression limiters are rated for up to class 10.9 bolts. Recommended installation torque is 20 Nm ± 2Nm.



2X Ø.346 FOR M8 FASTENERS  
STAINLESS STEEL COMPRESSION LIMITERS  
RATED FOR UP TO CLASS 10.9 BOLTS



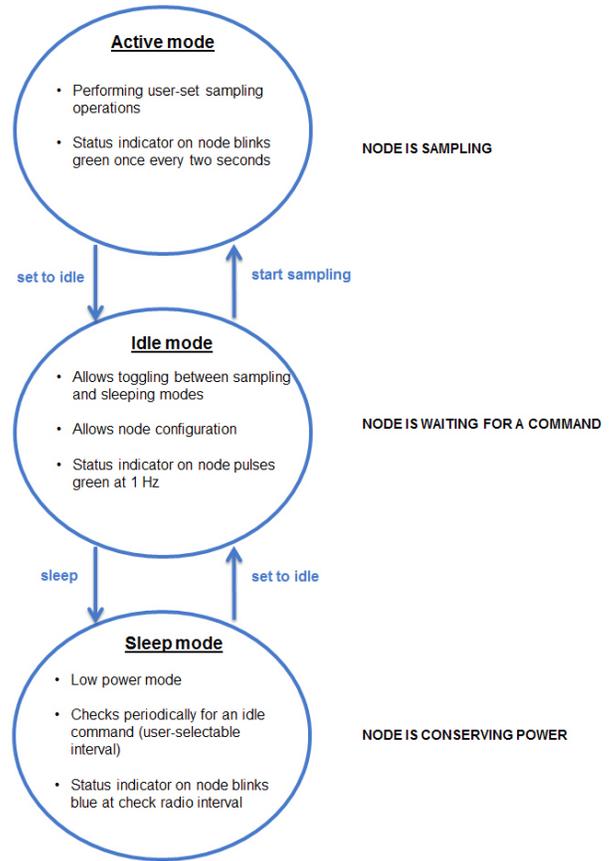
## Mounting Dimensions



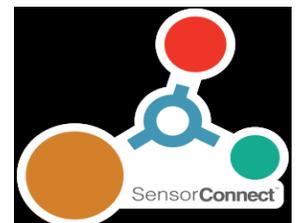
Pin 1 location

## Node Operational Modes

Sensor nodes have three operational modes: active, sleep, and idle. When sampling, the node is in active mode. When sampling stops, the node switches into idle mode, which is used for configuring node settings and allows toggling between active and sleep mode. The node will automatically enter into sleep mode after a user-determined period of inactivity. The node will not enter into sleep mode while active.



## Node Operational Modes



## Step 1 Install Software

Install the SensorConnect software on the host computer before connecting hardware. Access the free software download on the LORD Sensing website.



<http://www.microstrain.com/software>

# SG-Link-200 Quick Start Guide

## Step 2 Getting Started with SensorConnect software

Once the software has been downloaded and installed on your computer, activate your wireless gateway, and connect it to a USB port. We are using a WSDA-200-USB for this guide.

## Step 3. Establish Gateway Communication

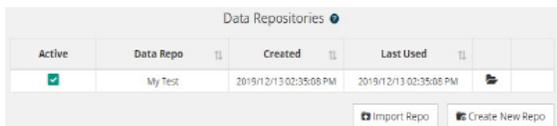
Drivers for the USB gateways are included the SensorConnect software installation. With the software installed, the USB gateway will detect automatically whenever the gateway is plugged in.

Power is applied to the gateway through the USB connection. Verify the gateway status indicator is illuminated, showing the gateway is connected and powered on.

The gateway should appear in the Controller window with a communication port assignment. If the gateway is not discovered, verify the port is active on the host computer, then remove and re-insert the USB connector.

## Step 4. Identify a data repository.

Sensor data, dashboards and setups are stored in files called Data Repositories. The program will create a data repository on its first start. Click on HOME. You should see a screen like this:



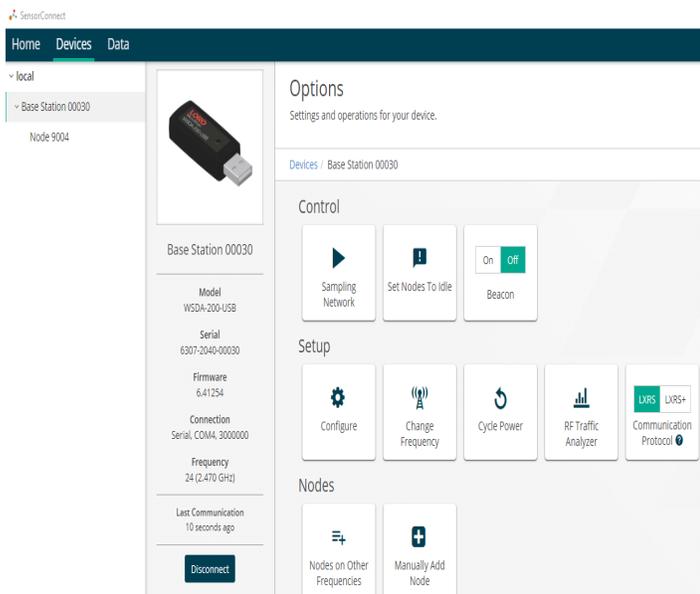
Active	Data Repo	Created	Last Used	
<input checked="" type="checkbox"/>	My Test	2019/12/13 02:35:08 PM	2019/12/13 02:35:08 PM	

Buttons: Import Repo, Create New Repo

Repositories are limited only by the size of your computer's data storage. You may have as many repository files as you like, name them by date, application, or function, and switch between them, as appropriate to your work.

You cannot delete data from a data repository. Creating a new one will provide a fresh start. Click on 'create new repo', name it as you like, and check the active box.

Click on Devices, to see your gateway:



Options  
Settings and operations for your device.

Devices / Base Station 00030

Control

- Sampling Network
- Set Nodes To Idle
- Beacon (On/Off)

Setup

- Configure
- Change Frequency
- Cycle Power
- RF Traffic Analyzer
- Communication Protocol (LXRS/LXRS+)

Nodes

- Nodes on Other Frequencies
- Manually Add Node

Base Station 00030

- Model: WSDA-200-USB
- Serial: 6307-2040-00030
- Firmware: 6.41254
- Connection: Serial, COM4, 3000000
- Frequency: 24 (2.470 GHz)
- Last Communication: 10 seconds ago

Buttons: Disconnect

## Step 5. Connect to Nodes

Upon power-up, nodes broadcast a Node Discovery Packet on all channels. This enables two methods to establish communication in SensorConnect: automatic node discovery on the same frequency, and automatic node discovery on a different frequency.

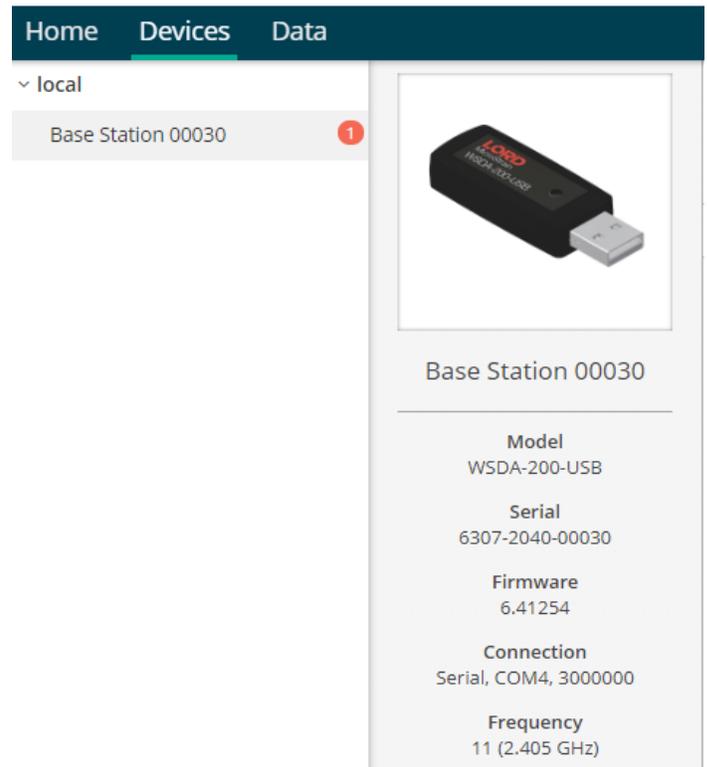
### Automatic Node Discovery on Same Frequency

If the gateway base and the node are on the same operating frequency, the node will populate below the Base Station listing when powering on the SG-Link-200.

Node 9004 is also visible, in the screen. Both the gateway and node are on channel 24, (2.470GHz). Click on the sampling network tile to verify the connection.

### Automatic Node Discovery on Different Frequency

If a red circle with a number appears next to the base station, the node is operating on a separate radio channel. Select the base station, then select the nodes on other frequencies tile. To illustrate this we have moved the gateway base station to channel 11.



Home Devices Data

local

Base Station 00030 1



Base Station 00030

- Model: WSDA-200-USB
- Serial: 6307-2040-00030
- Firmware: 6.41254
- Connection: Serial, COM4, 3000000
- Frequency: 11 (2.405 GHz)

### Node on Other Frequency

# SG-Link-200 Quick Start Guide

In the next screen, you can see a list of nodes within range of the gateway. Node 9004 happens to be available for this exercise, so we'll move the gateway to channel 24 to link to it.

**Linked to Node 9004 on channel 24 indicated by the green dot next to the node:**

Node	Frequency	Last Heard
9004	24	1 minute 1 second ago
8001	22	1 minute 20 seconds ago
24244	22	1 minute 48 seconds ago
8511	18	1 day ago

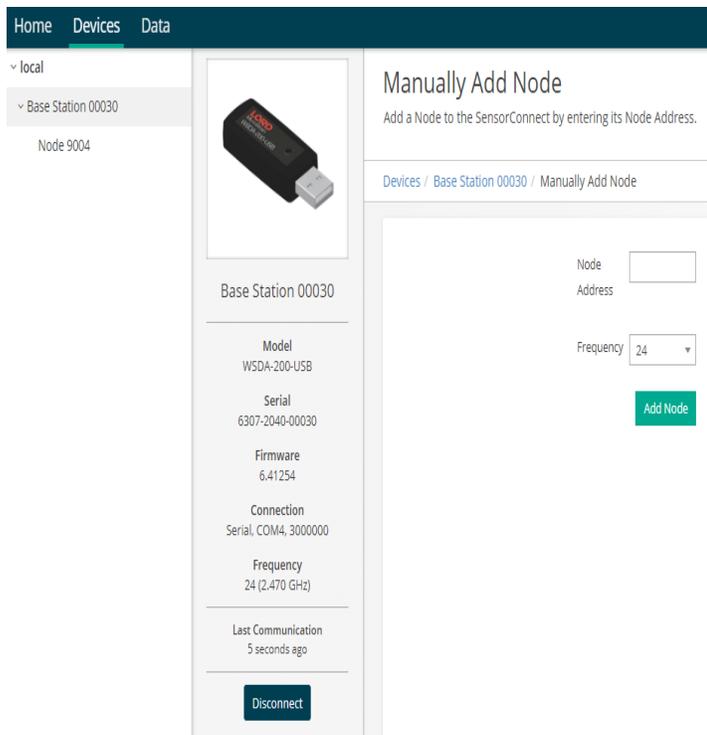
**Move the base from channel 11 to channel 24 to link:**

**Manually Add Node:**

This mode is intended for use when the node power cannot be toggled, to cause a discovery packet to be broadcast. The node might be installed in an unaccessible location, or on a vehicle, for example. You must know the frequency the node is on, and its address. (This can be found on its case, and in the accompanying documentation.) Nodes are factory set to channel 15. If you haven't changed the node frequency, it may still be there. To set your gateway to channel 15, click on change frequency, and enter 15 in the 'new frequency' window:

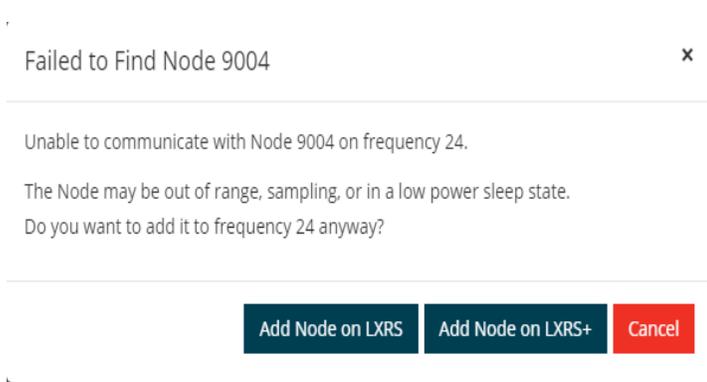
# SG-Link-200 Quick Start Guide

Then click on the 'manually add node' tile. The following screen will appear:



If your node is not on channel 15, and you don't know its operating frequency, you will have to search manually. Set the base station to each available channel, in sequence, and click the 'manually add node' tile, until the node is discovered.

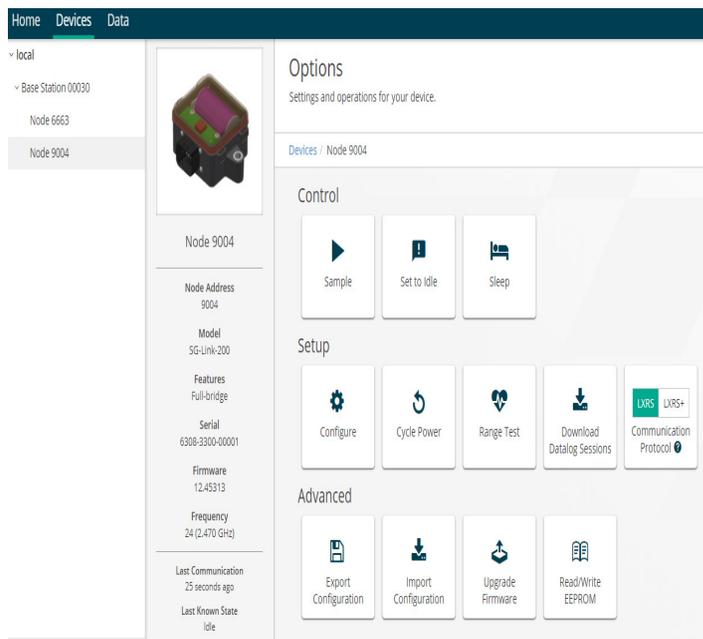
If your node is not on the tested frequency, or is in idle mode, you will see this screen:



If repeated efforts do not produce a connected node, please consult customer support; contact information is found at the end of this document.

## Step 6. Configure Node

Node settings are stored to non-volatile memory and are configured using SensorConnect. Select the Node under the Devices menu. Click on the Configure button under the Setup heading.

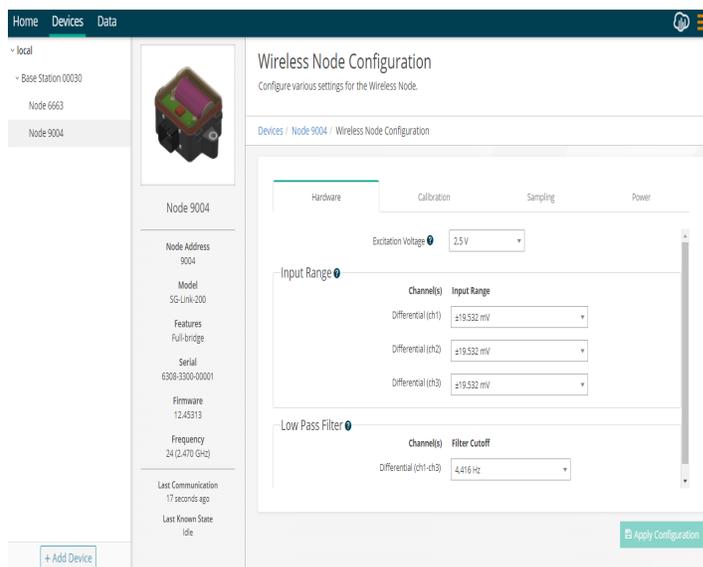


The Hardware menu tab displays the current node settings.

To change the default input range settings, use the dropdown menus found under Input Range. This setting is used only when the sensor type is set to Uncompensated Resistance.

To change the default Low Pass Filter settings, use the dropdown menu found under Filter Cutoff.

Select 'Apply Configuration' to write to node memory.

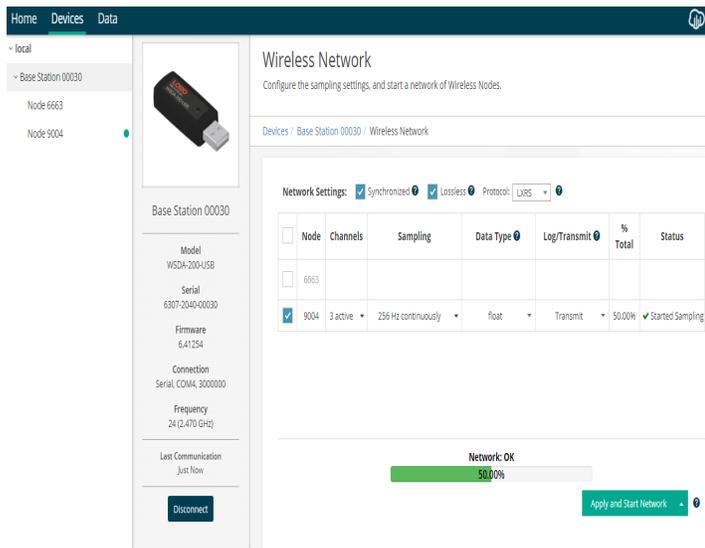


Hardware Configuration Tab

# SG-Link-200 Quick Start Guide

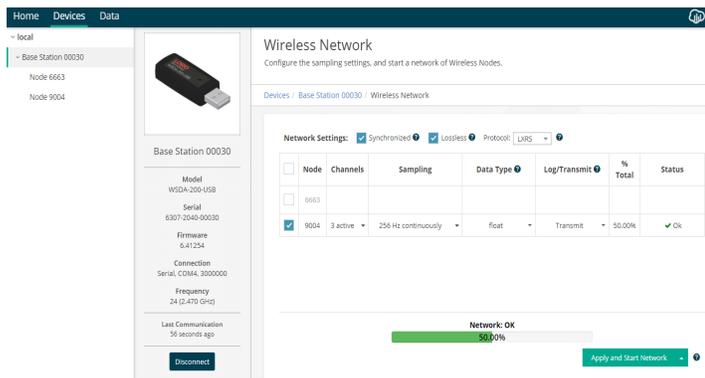
## Step 7 Configure Sampling Setting and Start Data Acquisition

Click the Base Station > Sample Network tile, and indicate the nodes to be sampled by clicking on them.

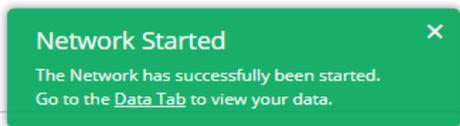


Under the Sampling column, select Sample Rate from the drop down menu. Select Continuously to sample indefinitely.

Click on Apply and Start Network

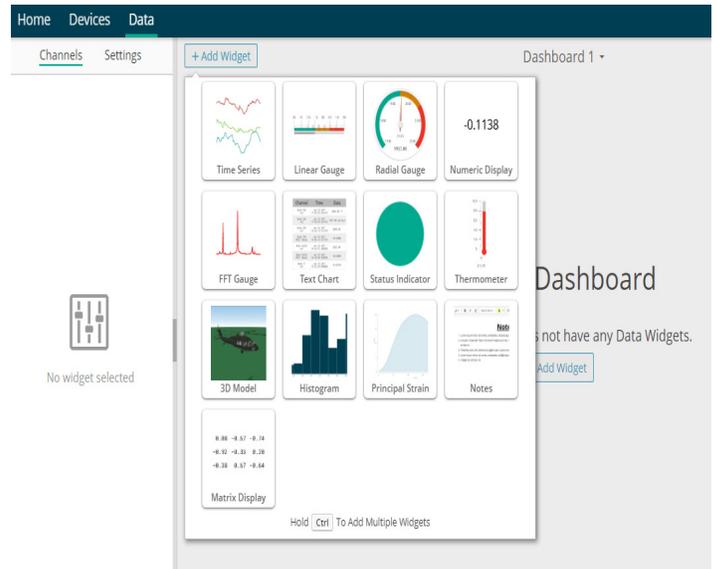


You will see the following message:



## Step 8. View Data

Click on the Data tab. You'll see an empty dashboard. Then click on the + Add Widget button, and select Time Series:



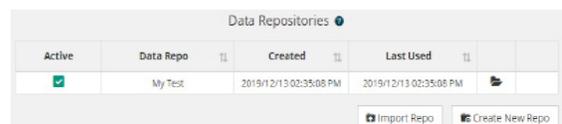
The node's three channels are listed beneath the node. Click on each of them, and observe data. In this example, we show three switched events, for illustration. Your data will be straight lines, unless strain gages have been configured.



Depending on what your strain gauges are monitoring, you may wish to have different display widgets, or a combination of display widgets, on your dashboard. You can re-size widgets, and move them around the dashboard screen to suit your needs.

## Step 9. Managing your data

When you're done exploring SensorConnect, click on Home. Your setup and preliminary data have been saved. This is an opportunity to create and activate a data repository for the next time. Click on 'create new repo', name it as you like, and check the active box, for next time.



# MicroStrain SG-Link-200 Quick Start Guide

## Radio Specifications

The SG-Link-200 employs a 2.4GHz IEEE 802.15.4 compliant radio transceiver for wireless communication. The radio is a direct-sequence spread spectrum radio and can be configured to operate on 16 separate frequencies ranging from 2.405 GHz to 2.480 GHz. Following the 802.15.4 standard, these frequencies are aliased as channels 11 through 26. For all newly manufactured nodes, the default setting is 2.425 GHz (channel 15).

### SG-Link®-200

**FCC ID: XJQMSLINK0011**

**IC ID: 8505A-MSLINK00 11**

This device complies with Part 15 of the United States FCC Rules, and Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions: 1) This device may not cause interference, and

2) This device must accept any interference, including interference that may cause undesired operation of the device. Changes or modifications, including antenna changes not expressly approved by MicroStrain Sensing could void the user's authority to operate the equipment.

Parker Hannifin Corporation  
**MicroStrain Sensing**  
459 Hurricane Lane  
Williston, VT 05495  
phone 802 862 6629  
Email: [sensing\\_sales@LORD.com](mailto:sensing_sales@LORD.com)  
[www.microstrain.com](http://www.microstrain.com)  
[www.parker.com](http://www.parker.com)

Copyright 2020 Parker Hannifin Corp. revision A Subject to change without notice.



ENGINEERING YOUR SUCCESS