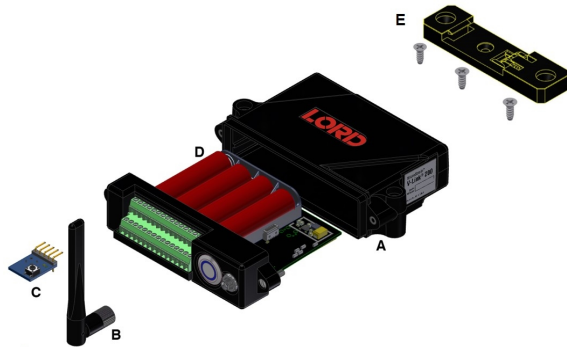# V-Link®-200
Wireless 8 Channel Analog Input Sensor Node

The V-Link-200 wireless sensor node features eight analog input channels designed to accommodate a wide range of Wheatstone bridge and analog sensors, including strain, load cell, torque, pressure, acceleration, vibration, magnetic field, displacement, and geophones. There are four channels for single-ended sensor measurement, four channels for differential sensor measurement, and an on-board internal temperature sensor.

To acquire sensor data, the V-Link-200 is used with a LORD Sensing data gateway such as the WSDA-101 or WSDA-1500 Base. V-Link-200 sensor nodes come with the following components.

Item	Description	Quantity
A	V-Link-200	1
B	Antenna with right angle adapter	1
C	Node tester board	1
D	AA Lithium batteries (3.6 V dc, 2.4 Ah)	4
E	DIN rail clip	1
	#6-32 x 3/8" Thread forming screws	3

The V-Link-200 LEDs indicate operational modes showing when the node is booting up, idle and waiting for a command, sampling, resynchronizing, or if there is an error.
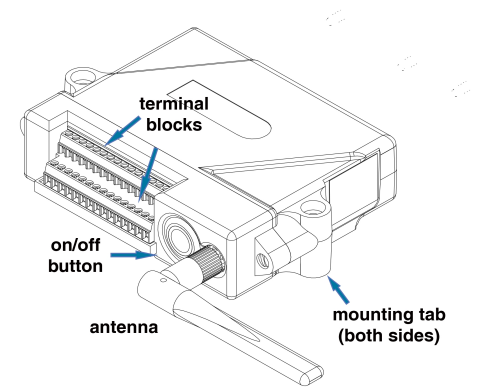

Figure 1 - Interface and Indicators

Indicator	Behavior	Node Status
Device status indicator	OFF	Node is OFF
	Rapid green flashing on start-up	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	Error or low battery

Wireless Simplicity, Hardwired Reliability™

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SYSTEM OPERATION

Sensor nodes have three operational modes: *active*, *sleep*, and *idle*. When the node is sampling, it is in active mode. When sampling stops, the node is switched into idle mode, which is used for configuring node settings, and allows toggling between sampling and sleeping modes. The node will automatically go into the ultra low-power sleep mode after a user-determined period of inactivity. The node will not go into sleep mode while sampling.
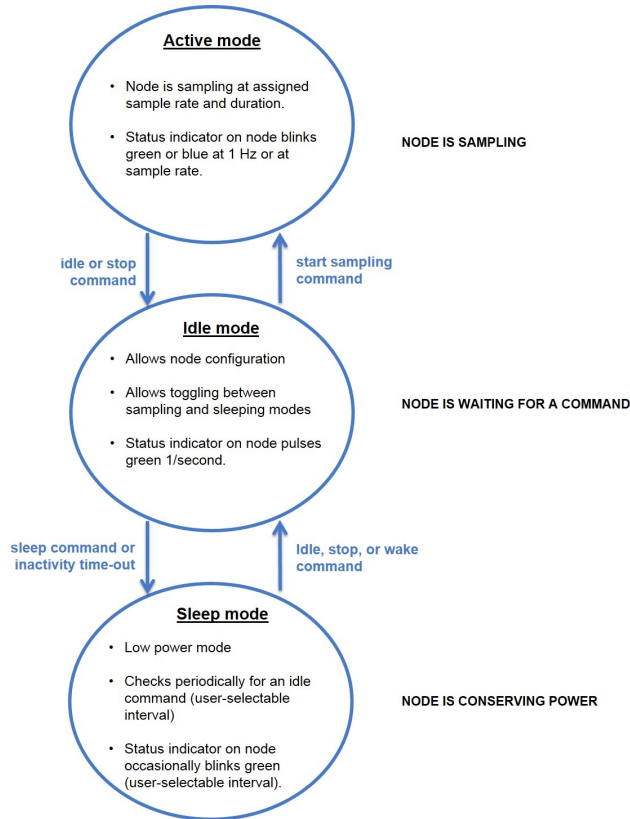
Active mode

- Node is sampling at assigned sample rate and duration.

- Status indicator on node blinks green or blue at 1 Hz or at sample rate.

NODE IS SAMPLING

idle or stop command | start sampling command

Idle mode

- Allows node configuration

- Allows toggling between sampling and sleeping modes

- Status indicator on node pulses green 1/second.

NODE IS WAITING FOR A COMMAND

sleep command or inactivity time-out | Idle, stop, or wake command

Sleep mode

- Low power mode

- Checks periodically for an idle command (user-selectable interval)

- Status indicator on node occasionally blinks green (user-selectable interval).

NODE IS CONSERVING POWER

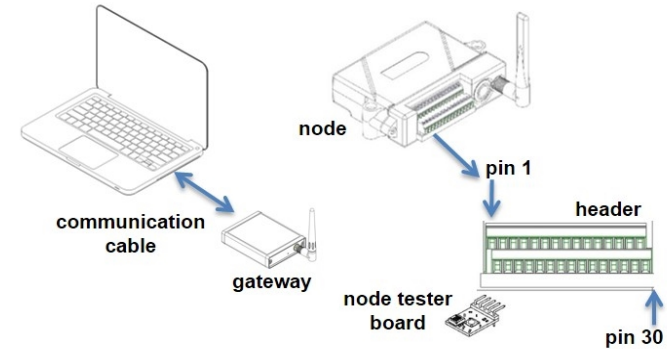**Figure 2 - Node Operational Modes**

1. Install Software

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

http://www.microstrain.com/software

2. Make System Connections

Node Pin Number	Signal	Node Pin Number	Signal
1	SP+	16	SP+
2	S1+	17	S4+
3	S1-	18	S4-
4	GND	19	GND
5	S1 S	20	S4 S
6	SP+	21	Ain5
7	S2+	22	GND
8	S2-	23	Ain6
9	GND	24	GND
10	S2 S	25	Ain7
11	SP+	26	GND
12	S3+	27	Ain8
13	S3-	28	GND
14	GND	29	Vin
15	S3 S	30	GND

terminal block connections

3. Establish Gateway Communication

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

1. 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.

2. Open the SensorConnect software.

3. The gateway should appear in the Controller window automatically with a communication port assignment. If the gateway is not automatically discovered, verify the port is active on the host computer, and then remove and re-insert the USB connector.
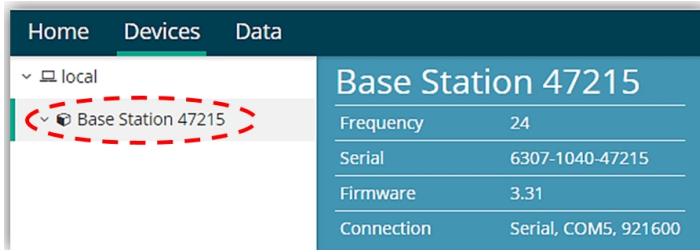
Figure 3 - USB Gateway Communication

4. Connect to Nodes

Several methods can be used in SensorConnect to establish communication with the nodes: the automatic node discovery feature, manually entering the node address, and scanning transmission frequency and node address ranges.

A. Add Node Via Node Discovery

If the base and node are on the same operating frequency, the node will populate below the Base Station listing when powering on the V-Link-200.
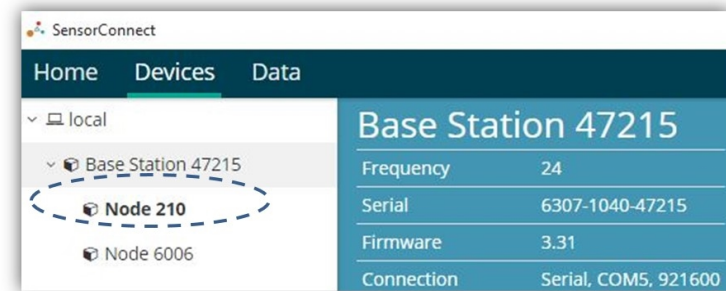
Figure 4 - Node Discovered On Same Frequency

If a red circle with a number appears next to the Base Station, the node is operating on a separate radio channel ().
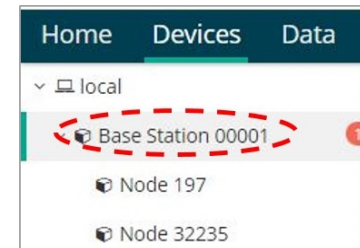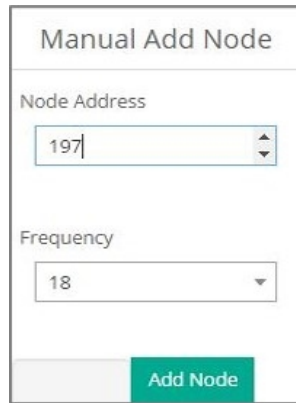

Figure 5 - Node On Other Frequency

3

B. Add Node Manually

Adding a node manually requires entering the node address and its current frequency setting.

From the Base Station, select the Manual Add Node tile, enter the Node Address, last known Frequency (factory default is 15), and select Add Node.

Figure 6 - Add Node By Address

If the node was successfully added, two confirmation messages will appear and it will be listed under the Base Station.
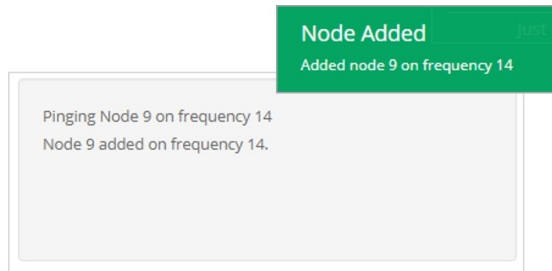

Figure 7 - Add Node Confirmation

If the node failed to be added, a failure message will appear. This means the node did not respond to the base station which could indicate the node is not in idle mode or it may be on another frequency. If "Add Node Anyway" is selected, it will associate that node with the channel entered but it is likely there will be a communication error. If the node was not in idle, move the base station to the frequency of the node and issue a "Set to Idle" command.
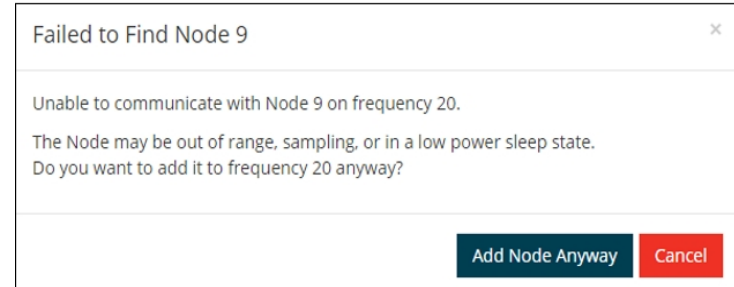

Figure 8 - Failure to Add Node

C. Move Node to Base Station Frequency

If a red circle with a number appears next to Base Station, the node is operating on a separate radio channel. Select the Base Station and then select the Nodes on Other Frequencies tile.
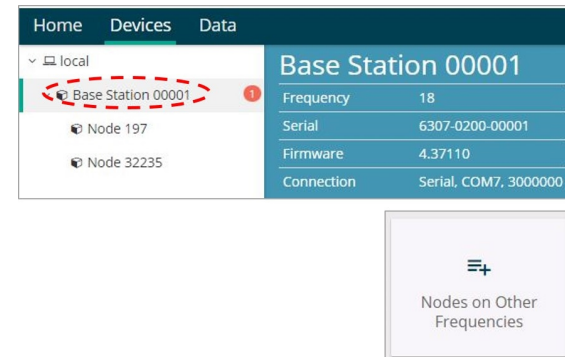

Figure 9 - Nodes On Other Frequencies

Highlight the new node being added and select Move Node to Frequency (#).

Figure 10 - Move Node

5. Configure Node

Node settings are stored to non-volatile memory and may be configured using SensorConnect. The configuration menus show the channels and configuration options available for the type of node being used.

For this example the V-Link-200 tester board is on channel 1.

1. Select Hardware > Input Range for channel 1, select +/-2 mV from the drop down menu.

2. Under Hardware Offset, select Balance Target for channel 1, select Mid (50%) from the drop down menu.

3. Select Auto-Balance. When auto-balance is complete, a blue information window will indicate the balance result.
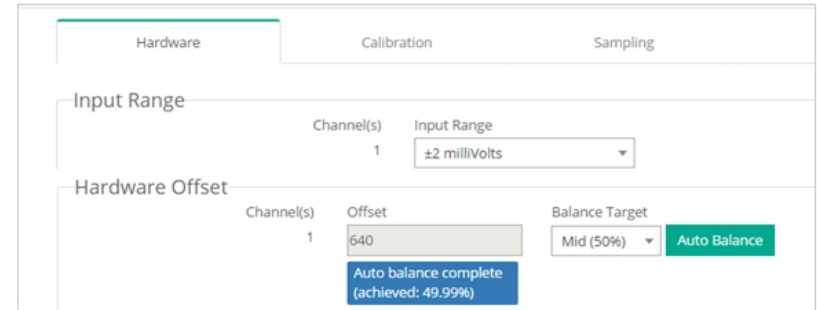

Figure 11 - Auto-Balance

4. Select Calibration.

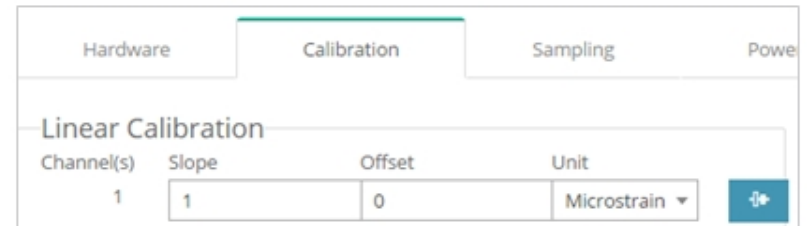5. Select Microstrain from the Unit drop down menu, and select the Shunt Cal button enabled on the right.

Figure 12 - Node Configuration Menu

6. Use the following settings:
   a. **Calibration Mode:** Internal
   b. **Number of Active Gauges:** 4
   c. **Gauge Factor:** 2
   d. **Gauge Resistance:** 1000
   e. **Shunt Resistance:** 499000

7. Select Start Shunt Cal for Slope and Offset calibrations.

8. Select Accept Calibration.

Figure 13 - Channel Settings

9. When the calibration is complete, the Wireless Node Configuration window will appear.

10. Select Apply Configuration to write to node memory.

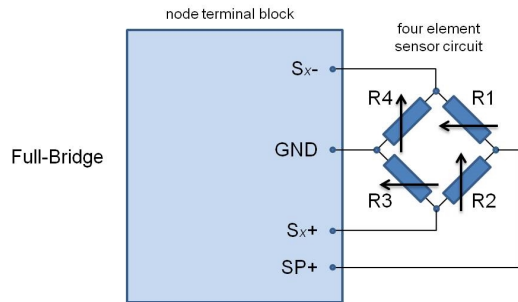See below for wiring of other strain gauges.
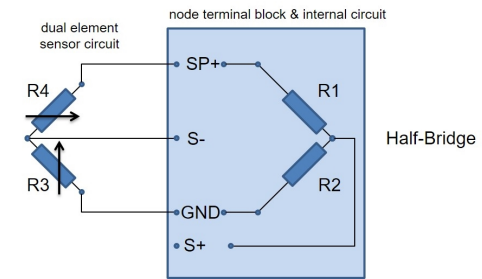

Figure 14 - Full-Bridge (Standard)
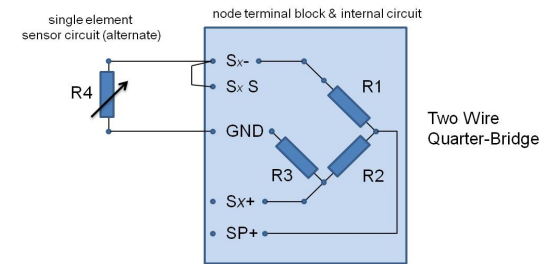

Figure 15 - Half-Bridge *

Figure 16 - Two Wire Quarter-Bridge *
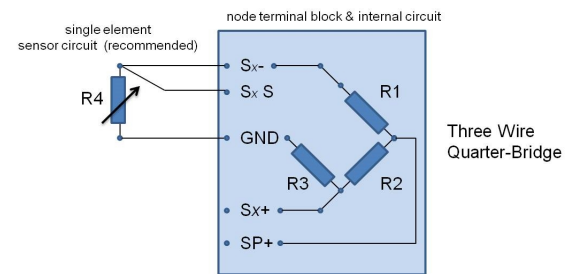
Figure 17 - Three Wire Quarter-Bridge *

* Requires optional on-board bridge completion

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6. Configure Sampling Setting and Start Data Acquisition

1. Left click on the Base Station > Sampling, and indicate the nodes to be sampled by checking the box to the left of each node.

2. Under 3 Channels, select Raw Channels, ch1, ch2 and ch3 from the drop down menu.

3. Under Sampling, select Sample Rate from the drop down menu, select Continuously to sample indefinitely, or For to set a limited time for sample sets.

Figure 18 - Sampling Setting

4. Select Apply and Start Network.

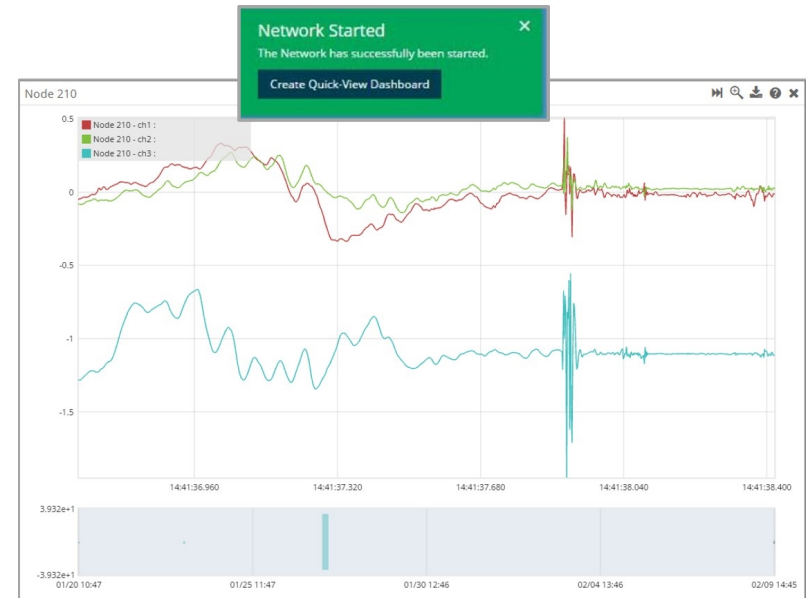5. Select Create Quick View Dashboard in the pop up window immediately to create a dashboard of the new data.

Figure 19 - Quick View Dashboard

7. Replacing Batteries

1. Remove the screws on both sides of the face plate to open the V-Link-200.

2. **It is important to replace all four of the batteries at the same time**, observing the correct polarity orientation. The positive polarities are indicated on the batteries and the node by a "+" symbol.
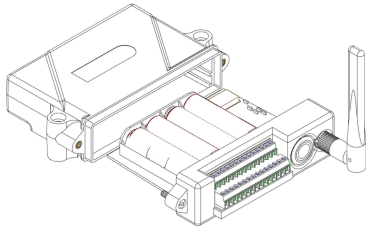
3. Reassemble.

Figure 20 - Replace Batteries

8. Battery Hazards

The V-Link-200 contains internal, non-rechargeable lithium batteries. Lithium batteries are a fire and explosion hazard. Do not store or operate the node at temperatures above 212°F (100°C). Do not disassemble, short circuit, crush, puncture, or otherwise misuse the battery.

Lithium batteries contain toxic chemicals that are harmful to humans and the environment. Disposal is subject to federal and local laws. Do not discard the battery or the node in the trash. Follow proper battery disposal protocol, or contact LORD Sensing Technical Support for information on extracting the battery or returning the product for proper recycling and disposal.

9. Power Supply

Apply only the input voltage range specified for the V-Link-200 . Connect to a power source that is near the device, is accessible, and adheres to all national wiring standards. Compliance with wiring standards is assumed in the installation of the power source and includes protection against excessive currents, short circuits, and ground faults. Failure to do so could result in personal injury and permanent damage to the device.