
Agent Software Program

Instruction Manual

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1. SOFTWARE INSTALLATION AND OVERVIEW

1.1 INSTALLATION

1.1.1 MINIMUM SYSTEM REQUIREMENTS

Before installing Agent Software onto a computer, verify that it meets these minimum system requirements:

- Microsoft Windows® 7, 8, or 10, running a 32 or 64-bit operating system
- 1 GB of free RAM (physical memory) available during runtime


1.1.2 DOWNLOAD AND INSTALLATION

To install Agent software, complete the following:

1. Go to <http://www.GEOKON.com/Software>.
2. Select the appropriate Agent installer based on the operating system of the computer:
 - For 32-bit systems, download **Agent Software (x86)**
 - For 64-bit systems, download **Agent Software (x64)**

To determine the computer's operating system: select **Start** and type **system** in the start search box. Select **System** in the list under **Control Panel**. Locate the **System Type** In the window that opens or use a web browser to go to the following address:

<https://support.microsoft.com/en-us/kb/827218> and follow the instructions.)

3. Locate and open the Agent-x64.zip (or Agent-x86.zip) folder that was downloaded from the GEOKON website.
4. Double click on the windows installer icon: 
5. If a security warning appears, select **Run**.
6. Read the License Agreement in its entirety. Check the box below the agreement to accept the terms of the agreement. This box must be checked to continue with the installation.
7. Select **Install**.
8. When the installation is complete, select **Finish** to close the installer and launch the program.

NOTE: Software is updated frequently. Check regularly for updates to make sure the latest version is being used.

1.2 PROGRAM OVERVIEW

Projects contain GeoNet Networks and/or LC2 Data Loggers. All GeoNet devices (i.e., Model Series 8800, 8900, 8920, 8930, 8940, and 8950) are categorized as GeoNet Networks. All LC2 models (i.e., Models Series 8002) are categorized as LC2 Data Loggers. Users can sort their GeoNet Networks and LC2 Data Loggers into groups by saving them in different Projects.

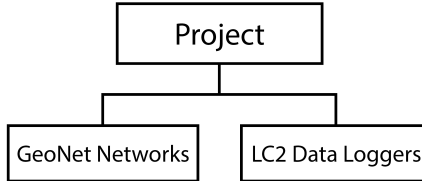


FIGURE 1: Program Hierarchy, Top Tier

Sensors in the Agent program represent GEOKON instruments connected to Loggers, as well as the internal sensors contained within a Gateway, Logger, and LC2. **Charts** display the data imported by sensors in as a graph. Each device can have multiple sensors and charts assigned to them.

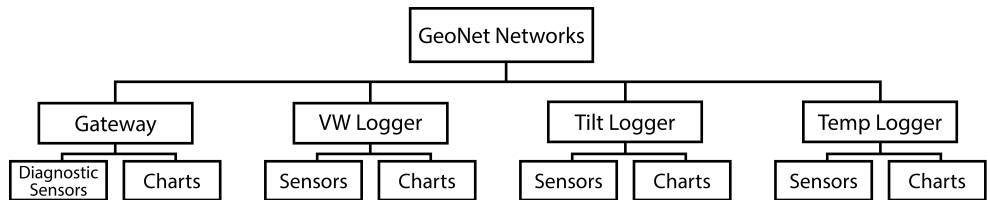


FIGURE 2: GeoNet Networks Hierarchy

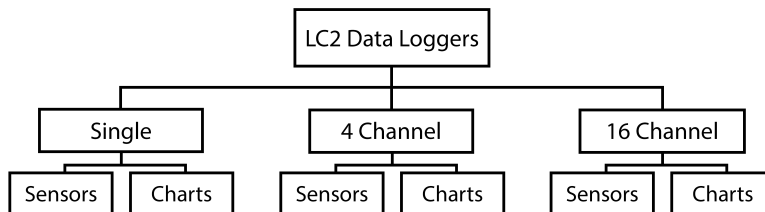


FIGURE 3: LC2 Data Loggers Hierarchy

The menu on the left side of the screen (Figure 4) is used to navigate the program and expands and contracts as the user navigates through the different levels of the program's hierarchy.

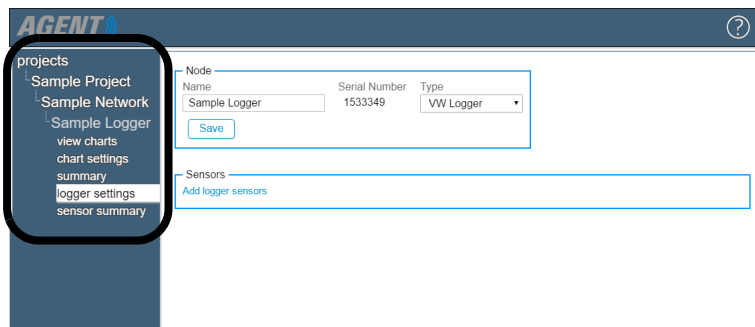
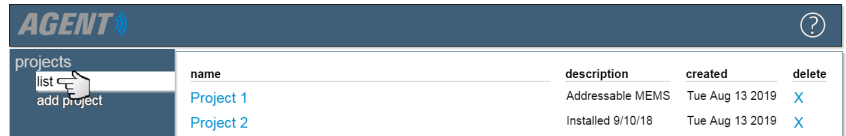


FIGURE 4: Left Pane Menu

2. PROJECTS

2.1 ADD A PROJECT

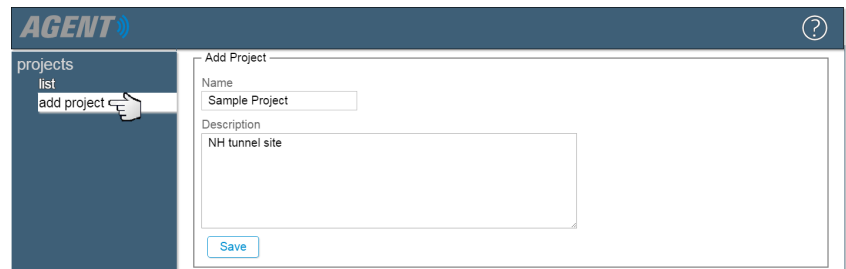
Projects allow the user to sort GeoNet Networks and LC2 dataloggers into groups by saving them under different Projects. On startup, Agent defaults to a screen that lists all the Projects that were created (Figure 5).



name	description	created	delete
Project 1	Addressable MEMS	Tue Aug 13 2019	X
Project 2	Installed 9/10/18	Tue Aug 13 2019	X

FIGURE 5: Project List

To create a new project, select **add project** on the left side of the screen. This opens the Add Project screen (Figure 6). Give the Project a name and add a description if desired. Select **Save** when finished.



Add Project

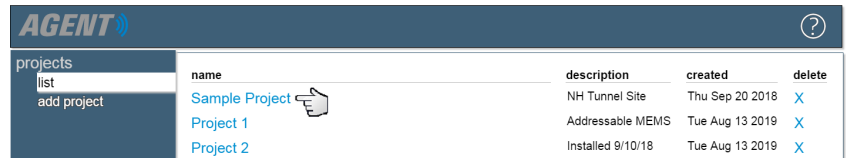
Name
Sample Project

Description
NH tunnel site

Save

FIGURE 6: Add Project

When a new project is created, **Agent** returns to the **Project** list.



name	description	created	delete
Sample Project	NH Tunnel Site	Thu Sep 20 2018	X
Project 1	Addressable MEMS	Tue Aug 13 2019	X
Project 2	Installed 9/10/18	Tue Aug 13 2019	X

FIGURE 7: Projects List Screen

The Project list is accessed by selecting **list** on the left side of the screen (Figure 5). When not in the Projects portion of the program, selecting **projects** on the left side of the screen opens the Projects list.

To delete a Project, select the corresponding **X** in the delete column. Deleting a Project removes all the information associated with it, **use with caution**.

2.2 OPEN A PROJECT

Open a project by selecting the project name (Figure 8).

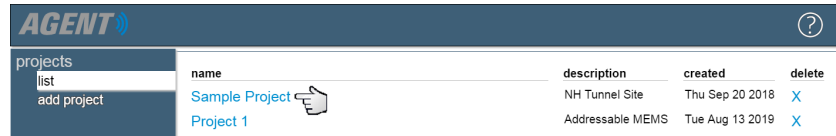


FIGURE 8: Select a Project

Agent goes to the List screen. The project menu (Figure 9) displayed on the left side of the screen.

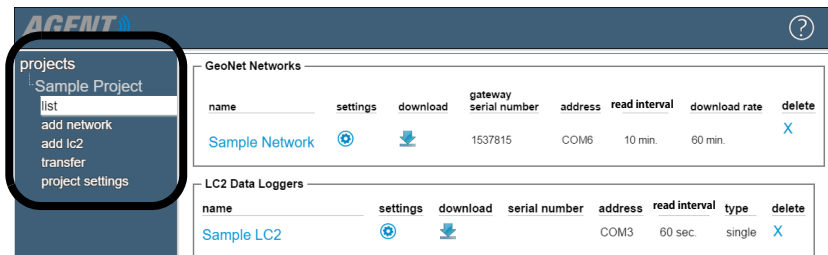


FIGURE 9: Project Menu (Left Side of the Screen)

The Project menu is covered by the following sections:

List: The List screen shows all the GeoNet Networks and LC2 dataloggers associated with the Project. See *Section 3.3* for information on GeoNet Networks and *Section 4* for information on LC2 dataloggers.

Add Network: Adds a GeoNet Network to the current project. See *Section 3.1*.

Add LC2: Adds an LC2 datalogger to the current project. See *Section 4.1*

Transfer: Use to transfer data from one Agent database to another. See *Section 7*.

Project Settings: Used to edit the project name and description, as well as to access the advanced settings of Agent. See *Section 2.3*.

2.3 PROJECT SETTINGS

2.3.1 GENERAL SETTINGS

To edit Project settings, select **list** on the left side of the screen (When not in the Projects portion of the program, select **projects** on the left side of the screen). Next select the name of the Project to edit (Figure 10).

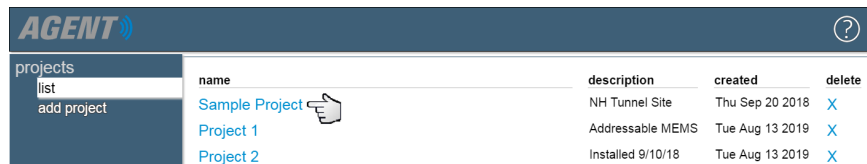


FIGURE 10: Select a Project

Next, select **project settings** on the left side of the screen (Figure 11).

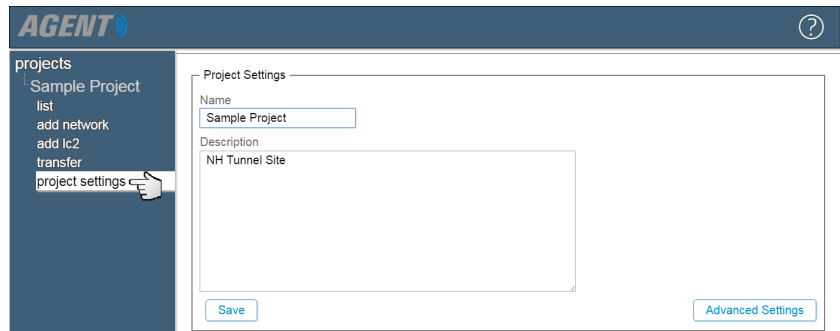



FIGURE 11: Project Settings Screen

Edit the project name and description as desired and then select **Save**.

3. ALL GEONET MODELS

IMPORTANT NOTE: As of version 1.8.1.5 the term **Node** was replaced with **Logger** and the term **Supervisor** was replaced with **Gateway**.

For this instruction, it is assumed that all relevant GeoNet hardware is installed. For information regarding the installation of GeoNet Hardware, please consult the relevant instruction manual. Instruction manuals are accessed inside the Agent program by selecting the  icon in the top right corner of the screen.

3.1 ADD A GEONET DEVICE

To connect to a GeoNet Gateway or Logger, select a Project and then select **add network** on the left side of the screen. This brings up the Settings screen (Figure 12).

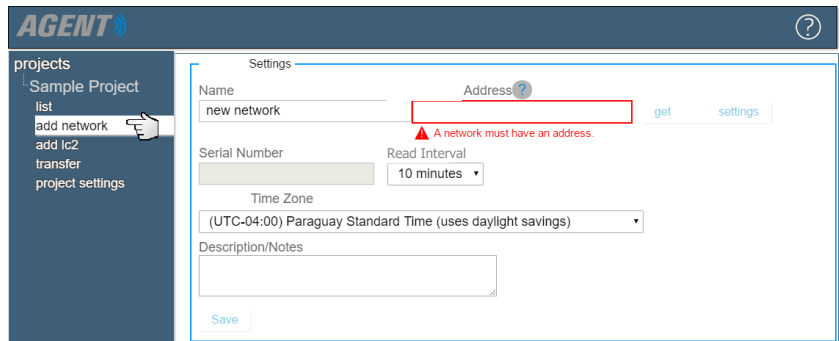


FIGURE 12: Settings Screen

Continue by reading the appropriate section, depending on how the Gateway or Logger is communicating with the PC:

- For connections using a **USB or RS-232 cable**, refer to *Section 3.1.1*. (I.e., All Model 8940 Series hardware and Model 8800/8900 Series Gateways ending in -SUP-232 or -SUP-USB.)
- For connections through the **GEOKON API Portal**, refer to *Section 3.1.2*. (I.e., All Model 8920, 8930, and 8950 Series Hardware and Model 8800/8900 Series Gateways ending in -LTM-USB or -03G-USB.)
- For **wireless** connections using an **exterior (add on) network device** such as a serial server or cellular modem, refer to *Section 3.1.3*. (I.e. Model 8800-2-4A and Model 8800-2-4B.)

3.1.1 CONNECTIONS THAT USE A USB OR RS232 CABLE

Type **COM** into the **Address** field to display a list of available COM ports. Choose the correct port from the list (Figure 13) or type in the full name of the desired COM port.

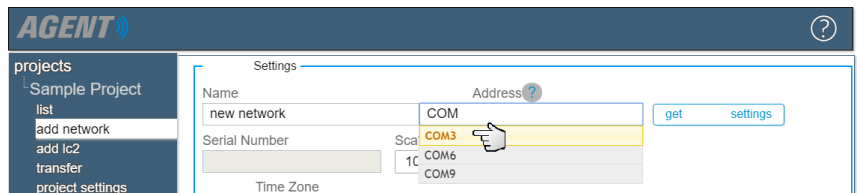


FIGURE 13: Enter a Comm Port

If the correct COM port does not display in Agent, make sure the device is powered on and the cable connection is secure, and then try again. If the COM port the Gateway/Logger is using is unknown, refer to the information in Appendix A. When the address is entered, continue to *Section 3.2*.

3.1.2 CONNECTIONS USING THE GEOKON API PORTAL

The Gateway/Logger must already be commissioned using the GEOKON API portal at: <https://api.geokon.com>. A tutorial on using the API portal is available at: <https://www.geokon.com/Videos>

Copy a token from the API portal, paste it in as the Address, and select get settings (Figure 14). When the address is entered, continue to *Section 3.2*.

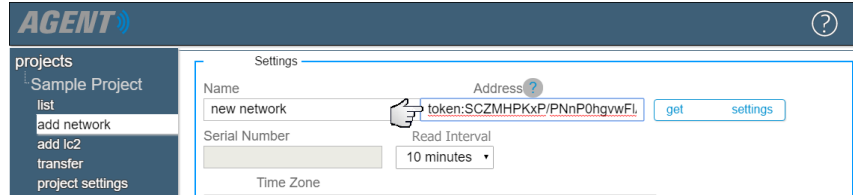


FIGURE 14: Enter a Token

3.1.3 WIRELESS CONNECTIONS THAT USE AN EXTERIOR (ADD ON) NETWORKED DEVICE

Enter the device URL or IP address into the Address field (Figure 15). An IP address must contain a colon after the address, followed by the port (192.168.1.1:5555). When the address is entered, continue to *Section 3.2*.

NOTE: When connecting with a serial server or cellular modem it can be necessary for the Network administrator to set the IP address for local Networks. Cellular modems usually have a static IP address designated by the carrier.

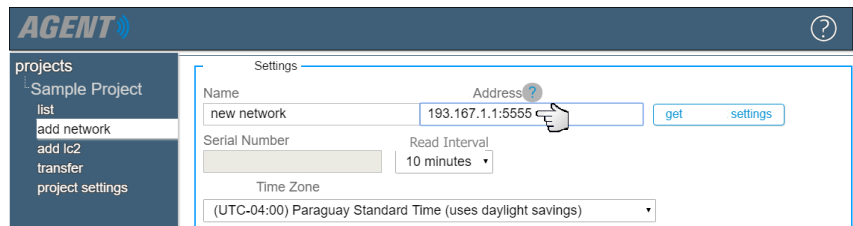


FIGURE 15: Enter a URL or IP Address

3.2 CONNECT

When the address is entered, select [get settings](#) (Figure 16). Agent attempts to connect to the Gateway/Logger.

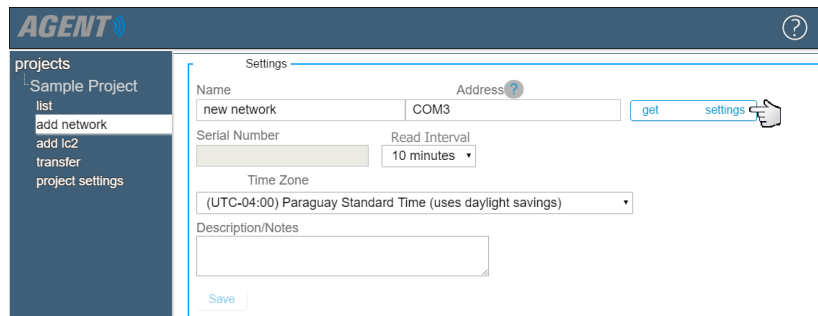


FIGURE 16: Get Network Settings

When a connection is established, the **Serial Number** field is populated and a Deploy Period drop-down appears.

If the connection is being made through the GEOKON API Portal, after selecting **get settings** a **Choose Cloud Network** drop-down appears. The drop-down list displays all gateways or loggers associated with that account. Select the desired gateway or logger from the list (Figure 17). An internet connection is required to access remote connections using IP addresses or a token.

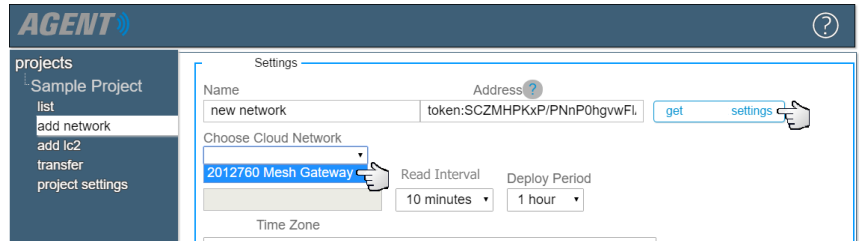


FIGURE 17: Select a Gateway/Logger

If Agent fails to establish a connection, an error message appears stating the reason for the failure. If this occurs, make sure the device is powered on, connectivity and data are indicated in the portal, and the token was not miscopied; then try again.

When a connection is established, the rest of the settings are edited as needed. See Table 1 below for information on each of the settings.

When all the information is entered select **Save**. Agent applies the settings and then goes to the Loggers screen. The Loggers screen is described in *Section 3.6*.

Label	Description
Address	The API token, COM port, URL, or IP address used to connect to the Gateway/Logger. See <i>Section 3.1</i>
get settings	Loads the current read interval, deploy period, and time zone from the Gateway/Logger.
Choose Cloud Network	This option appears after the get settings button is pressed if a token was entered as the Address. The drop-down contains all the gateways or loggers associated with the api.GEOKON.com account that created the Token .
Read Interval	Determines how often Loggers take sensor readings. While commissioning, the default 10 minute interval provides timely updates to verify operation. After initial commissioning, the read interval can be changed to prevent excessive drain on the batteries. See <i>Section 4.4.3</i> for more information.
Deploy Period	Sets how long a GeoNet Mesh radio network remains in deployment mode . Changes to this setting take effect the next time deployment mode is activated on the gateway. For information on deployment mode, see the Model 8800/8900 GeoNet instruction manual. Note: Use deploy mode when setting up a network or making hardware changes etc.
Time Zone	Use the drop-down to select the time zone that matches the network location. (The Time Zone is automatically for Gateway/Loggers connected to the API.)

TABLE 1: Description of Settings

3.3 LIST OF GEONET NETWORKS ASSOCIATED WITH A PROJECT

To view the GeoNet Networks associated with a Project, select the left side of the screen, then select the name of the Project (Figure 18). This opens the List screen (Figure 19).

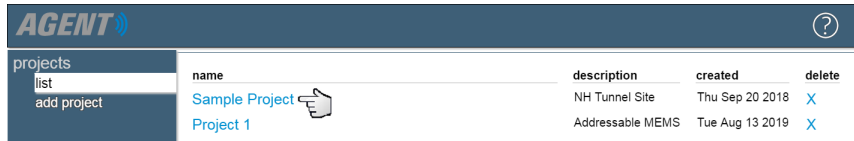


FIGURE 18: Select a Project

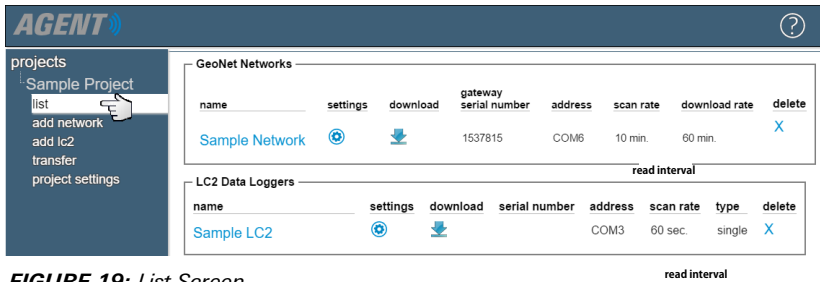


FIGURE 19: List Screen


The GeoNet Networks portion of the screen is detailed in Table 2 below. All GeoNet devices (i.e., Model Series 8800, 8900, 8920, 8930, 8940, and 8950) are categorized as GeoNet Networks.

Column Heading	Description
Name	Selecting the name of a Network opens the Loggers screen. See Section 3.6.
Settings	Select the icon to open Settings. See Section 3.4 for more information.
Download	Select the icon to manually download data from the Gateway/Logger/Network Servers. When the download begins, a status bar provides the number of readings available and the completion percentage. Only one Network is downloaded at a time. The download continues whether the user stays on the Network Settings screen or navigates elsewhere. Select to stop the download.
Gateway Serial Number	Static field showing the serial number of the Gateway/Logger.
Address	The API token, COM port, URL, or IP address used to connect to the Gateway/Logger. See Section 3.1
Read Interval	See Table 1 on page 11

Column Heading	Description
Download Rate	Displays the frequency of data collection from the Gateway/Logger/Network servers. Edit the parameter in Settings. See <i>Section 3.4</i> .
Delete	Select X to delete the corresponding Network. Deleting a Network erases ALL data associated with the Network; use with caution .

TABLE 2: Descriptions for the GeoNet Networks List

3.4 NETWORK SETTINGS

To edit the Network Settings, select the Project that contains the Network, and then select the  icon that corresponds to the Network to edit. Network settings is also accessed by selecting the name of the Network and then selecting **network settings**.

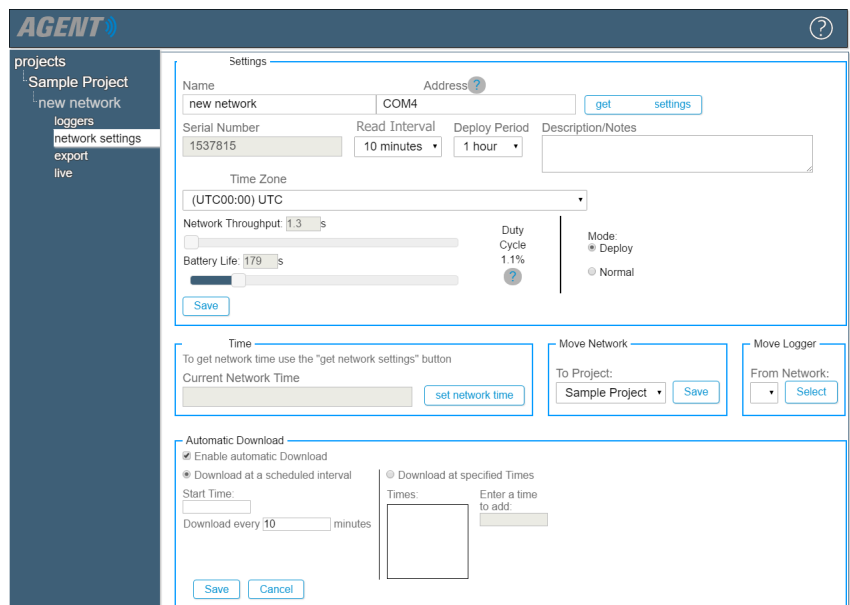


FIGURE 20: Network Settings Screen

Refer to Figure 20 through Figure 22 and the accompanying tables for more information on each of the network settings.

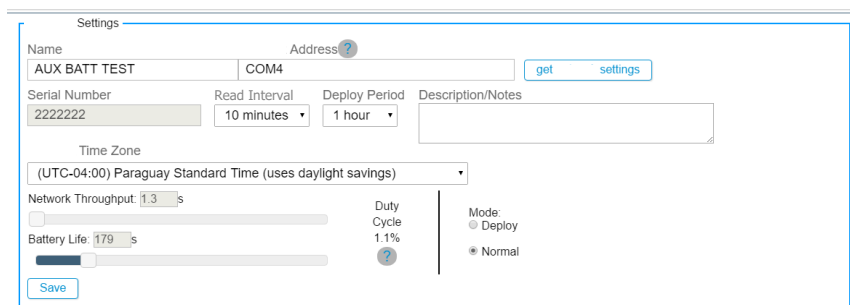


FIGURE 21: Settings Box

Column Heading	Description
Address	See Table 1 on page 11.
<input type="button" value="get settings"/>	Loads the current read interval, deploy period, and time from the Gateway/Logger.
Read Interval	See Table 1 on page 11
Deploy Period*	See Table 1 on page 11
Time Zone	Use the drop-down to select the time zone that matches the Network location.
Network Throughput*	Network Throughput is automatically set based on the network configuration. The automatic setting is suitable for most users. If Loggers frequently fall behind in delivering their readings, use the slider to adjust the Network Throughput setting in small increments. Increasing Network Throughput decreases the overall battery life. The Gateway limits the minimum setting based on network size to protect the network.
Battery Life*	Use the slider to adjust the Battery Life setting. A higher number increases the battery life but also increases the time between taking a reading, and when the data is sent to the Gateway.
Duty Cycle*	The Duty Cycle is determined by the Network Throughput and Battery Life settings. The number shown represents the percentage of time the network is on and able to transmit data. For maximum battery life the duty cycle should be as low as possible without the network falling behind (data from certain Loggers is older than others or falling behind.)
Mode*	Select the operating mode of the Network. Deploy Mode uses more battery life than Normal Mode . Deploy Mode should ONLY be used when setting up a network and whenever changes are being made to the network (adding Loggers, changing batteries, resetting a device, etc.) Refer to the GeoNet instruction manual for more information on the two operating modes of the network.

TABLE 3: Descriptions for Settings Box

**These settings are disabled when airplane mode is active.*

The figure shows three distinct UI boxes. The first box, titled 'Time', contains the instruction 'To get network time use the "get network settings" button', a text input field labeled 'Current Network Time', and a 'set network time' button. The second box, titled 'Move Network', contains the label 'To Project:', a dropdown menu currently showing 'Sample Project', and a 'Save' button. The third box, titled 'Move Logger', contains the label 'From Network:', a dropdown menu with a downward arrow, and a 'Select' button.

FIGURE 22: Time and Set Project Boxes


Label	Description
Current Network Time	Read only field. Value displayed after pressing the set network time or get Network settings buttons.
	Overwrites the current Network time with the date and time from the PC.
Move Network	Use the drop-down menu to move this logger or network to a different project.
Move Logger	Use the drop-down menu to transfer a Logger and all its settings from a different network to the current network. This is only used when the physical configuration in the field has changed (replacing a Gateway).

TABLE 4: Descriptions for Set Project Box

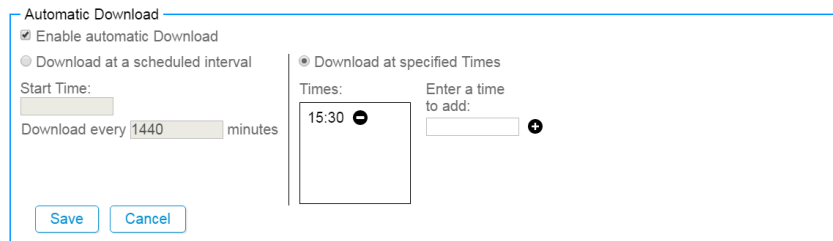


FIGURE 24: Automatic Download Box

Label	Description
Enable Automatic Download	Check this box to have data automatically downloaded at regular intervals. When unchecked, data is only downloaded when the user initiates a manual download (see <i>Section 4.5</i>).
Download at a scheduled interval	Select this option to have the automatic download recur in intervals. The frequency of the download is based on the integer entered in the Download data every __ minutes field. The first download occurs at the specified Start time . Start time must be entered in 24-hour format. For example, 3:30 PM becomes 15:30.
Download at specified Times	Select this option to have data automatically downloaded at specific times of the day. Enter a time in 24-hour format and then select the + icon. The time entered is added to the list of download Times :. To remove a download time from the list, select the corresponding - icon.

TABLE 5: Descriptions for Automatic Downloads Box

3.5 DATA STORAGE CAPACITY

For cellular gateways and loggers, the time from **Last Connect** to the present should not exceed the roll-over time.

Data is stored in the Gateway in a persistent **ring buffer**. The flash memory stores around one million arrays. When the memory is full, the oldest data is overwritten. If automatic download is turned off, collect data on a consistent basis to prevent data loss.

Loggers have multiple arrays per reading. The number is a function of the channel count. For a gateway, you must determine the array count for each specific logger, add all of the logger counts together, and then divide the gateway memory by that number and multiply by the read interval. This results in the roll over time.

Device	Channels	Arrays per Reading
Vibrating Wire	1-3	2
	4-6	3
	7-9	4
Tilt Loggers	1-2	2
	3-4	3
	5-6	4
Digital Temperature	1-10	2
	11-20	3
	21-30	4
Gateway	N/A	1

TABLE 6: Arrays per Day at Each Sample Interval

3.5.1 NETWORK EXAMPLE

Logger	Arrays per Reading	
01C	2	
04C	3	
08C	4	
IPI (6 drops)	4	
Gateway	1	
Total Read Interval	14	Arrays per Reading
	1	Hour
	336	Readings per Day
	3095	Days = Days until rollover

3.6 LIST OF GEONET DEVICES ASSOCIATED WITH A NETWORK

To view the Gateway and Loggers associated with a Network, select the Project that contains the Network and then select the Network name (Figure 25).

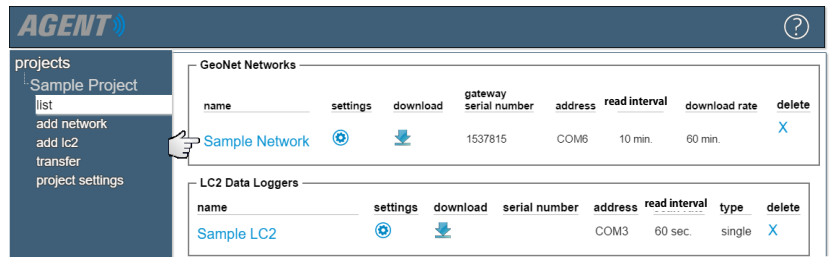


FIGURE 25: Selecting a Network

This opens the Loggers screen (Figure 26). The list of devices is sorted by selecting any of the column headers. Refer to *Table 8* for more information about the Logger screen.

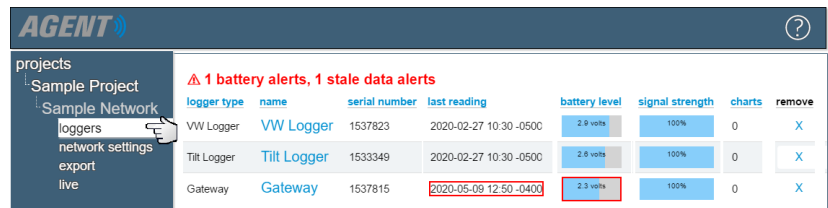



FIGURE 26: Loggers Screen

NOTE:

- Only Loggers that have joined the Network at least once are displayed.
- New Loggers do not appear until data arrives from that logger.
- Data for **last reading**, **battery level**, and **signal strength** update each time data is downloaded.

Column Heading	Description
 Alerts	Alerts are indicated by a message at the top of the Loggers screen and a red box around the data that triggered the alert. Devices that have not communicated during the last three scan attempts trigger a Stale Data alert. Devices with low battery or signal strength also trigger an alert.
Logger Type	Displays the device Type selected in the Logger Settings screen. See <i>Section 3.7</i> .
Name	Selecting the name of a Logger or Gateway causes Agent to go to the settings for that device. See <i>Section 3.7</i> .
Last Reading	The time the last data was received
Battery Level	Displays the battery voltage as of the Last Reading time. Replace D cell batteries when the battery level is indicating an alert.

Column Heading	Description
Signal Strength	Displays the signal strength of the radio communications between the device and the Network at the time of the Last Reading. Weak signal strength only needs to be addressed when data is arriving late. For information on improving the strength of the radio signal, refer to the Model 8800/8900 GeoNet instruction manual.
Charts	Displays the number of charts associated with the device. For information on working with charts see <i>Section 5</i> .
Remove	Select the X icon to delete the corresponding device. WARNING! Deleting a Logger or Gateway erases ALL the data associated with it. It is highly recommended to create an Agent Transfer file before deleting a Logger or Gateway. See <i>Section 7</i> for information on transfer files.

TABLE 8: Descriptions for the Loggers Screen

3.7 LOGGER SETTINGS

To edit Logger or Gateway settings, select a Network, then select the name of the device to edit (Figure 27).

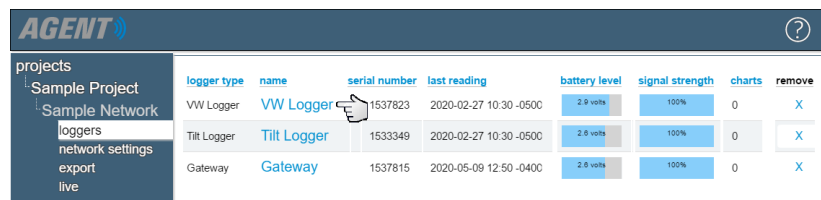


FIGURE 27: Select a Device

Agent goes to the View Charts screen. See Section 5 for information on working with charts. Select **logger settings** to go to the Logger Settings screen (Figure 28).

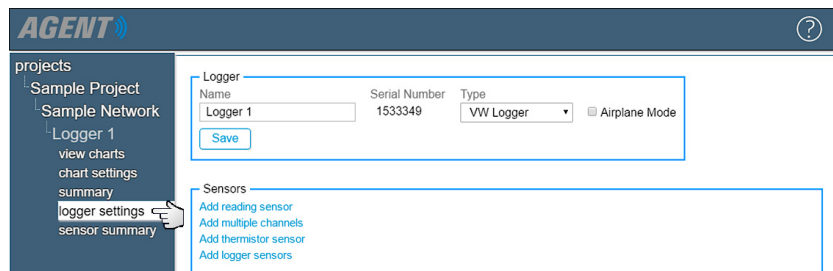


FIGURE 28: Logger Settings Screen

The Logger portion of the screen contains the basic information for the device. Refer to Table 9 below for more information.

Label	Description
Type	The type is set automatically for all devices and does not need to be changed unless the physical configuration in the field has changed. (For help changing the device type, please contact GEOKON.) Appendix B details the correlation between GeoNet models and the types available in Network Settings. This information is provided for reference only.
Airplane Mode	This option is only available when the Logger/Gateway is connected to a PC by a cable. Check the box to disable the wireless communications of the device. When a logger is in airplane mode, it will collect and store data from sensors as normal but will not transmit the data. A PC connection is required to collect data, make changes, or exit airplane mode. Loggers can be placed in airplane mode to be used as standalone devices, then later deployed into a network when airplane mode is disabled.

TABLE 9: Logger Settings

The **Sensors** portion of the screen allows sensors to be added to the device. The available sensor types are determined by the device **Type**. The subsections below cover the function of the various sensors.

Agent has 5 types of sensors:

Reading Sensors import data from external vibrating wire gauges connected to a GeoNet Logger (see Section 3.7.1).

Thermistor Sensors import data from thermistors connected to a GeoNet Logger, including thermistors inside gauges and thermistor strings (see Section 3.7.2)

Logger Sensors import data from the internal sensors of GeoNet Gateways and Loggers (see Sections 3.7.4).

Tilt Sensors (angle/deflection) import data from the MEMS tilt devices, including tiltmeters, inclinometers, and GeoNet Tilt Loggers (see Section 3.7.5).

2 axis tilt meter sensors import tilt data from legacy model 8800-1 and 8800-3 Nodes which had a 2 axis tilt meter installed (see Section 3.7.6).

3.7.1 READING SENSORS

Reading Sensors are used for external sensors (gauges) connected to the device by the user (piezometers, strain gauges, etc). To add a reading sensor to the device, select **Add reading sensor**. (Figure 29).

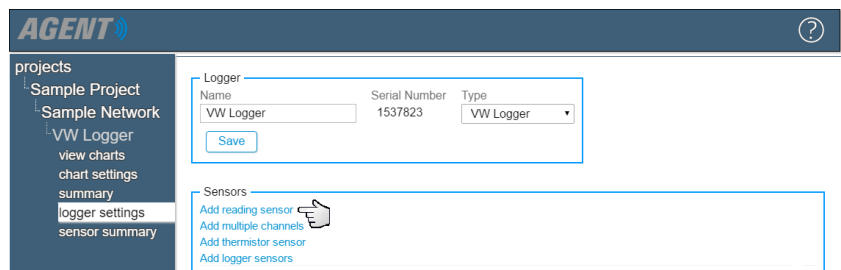


FIGURE 29: Add a Reading Sensor

This opens the **Edit Sensor** dialog (Figure 30). Table 10 describes the settings contained within the Edit Sensor dialog.

FIGURE 30: Edit a Reading Sensor

Label	Description
Serial Number	Enter the serial number of the gauge connected to the Logger. This is not required, but it is recommended to help the user differentiate gauges.
Get Calibration	Retrieves calibration data, if available, from GEOKON's database and populates the Linear Gage Factor (G), as well as the Polynomial gage factors A, B, and C.
Type	See Table 10 on page 22.
Category	Choose the category that coincides with the type of gauge connected. Refer to the manual that was supplied with the gauge if unsure.
Calibration Units	Available Calibration Units vary based on what category was chosen. The selected units should match the units of the gauge factor on the calibration report provided with the gauge.
Multiplier	Applied to the linear or polynomial calculation. It is used to convert units. If the selected output units differ from the calibration units , Agent automatically calculates the multiplier to convert the units.
Offset	Offset is an optional constant added to the sensor output to adjust the data. For example: If a piezometer installed at a site elevation of -40 feet is reading +2 feet of water, entering an offset of -40 would adjust the reading to -38 feet, the actual water elevation of the sensor.

Label	Description
Start/End Date	When a user changes a sensor on a channel, this feature allows them to end the first sensor, and start a new sensor. This tells Agent when to stop applying the first sensor calibration coefficients to the data from the channel, and start applying the new sensor coefficients. To change the start/end date select Change .
Choose a Color	Sets the color for the sensor on all charts. Select the current color to open the color palette. Select a standard color from the left side of the menu or use the color palette on the right to create a custom color and then select choose .
Calculation:	Shows the equation that is used to calculate the sensor output.
Output =	The output equation is the calculation applied to the data. The output equation changes automatically to reflect the information entered in the dialog.
Linear	Select to utilize the linear calibration equation.
Gage Factor (G)	The default gauge factor of one is used to output the data in digits. To output the data in other engineering units, the gauge factors found on the GEOKON Calibration Report provided with the vibrating wire sensor must be entered.
Zero Reading (R_0)	Enter the initial onsite zero reading. It is highly recommended that an accurate initial zero reading is obtained for each sensor, as this reading is used for all subsequent data reduction. However, the factory zero reading on the calibration report may be sufficient if no onsite zero reading exists. Consult the sensor manual for more information.
Polynomial	Select to utilize the polynomial calibration equation.
Factor A	Required for output in engineering units. Found on the GEOKON Calibration Report provided with the gauge.
Factor B	Required for output in engineering units. Found on the GEOKON Calibration Report provided with the gauge.
Factor C	Value is displayed after selecting Calculate C .
Calculate C	Calculates the value of Factor C from a user-entered zero reading.
Temperature Correction	If maximum accuracy is needed, or if ambient temperature changes are large, a temperature correction can be applied. Checking this box includes the values entered in the Thermal Factor and Zero Temperature fields in the output equation.
Thermal Factor (K)	Enter the Thermal Factor from the calibration report.

Label	Description
Zero Temperature (T_0)	If an onsite zero reading is used, enter the temperature at which the onsite zero reading was taken in degrees Celsius. If the factory zero reading is used, enter the temperature listed on the bottom of the GEOKON Calibration Report.

TABLE 10: Descriptions for Reading Sensors

When a Sensor is created, it is added to the list of sensors on the Logger Settings screen (Figure 31).

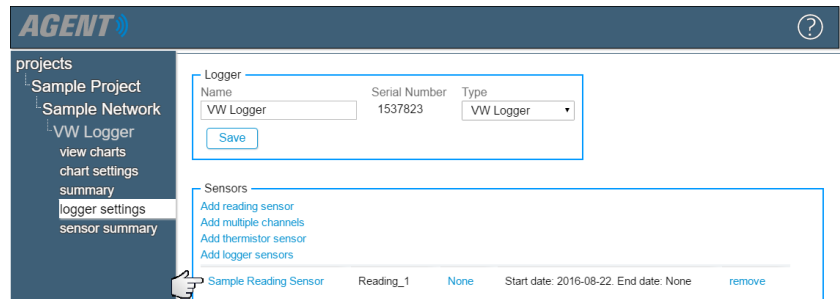


FIGURE 31: Reading Sensor Added

The sensor settings can be accessed at any time by selecting the name of the sensor.

The **Alerts** column is used to create alerts that are displayed on the View Charts and Live Charts screens when user defined criteria are exceeded. For information on alerts, see *Section 6*.

To delete a sensor, select **remove**.

3.7.2 THERMISTOR SENSOR

Most GEOKON vibrating wire sensors include a built-in thermistor. To view the temperature data collected by the thermistor, a **thermistor sensor** must be added in Agent. To add a thermistor sensor, select **Add thermistor sensor** (Figure 32).

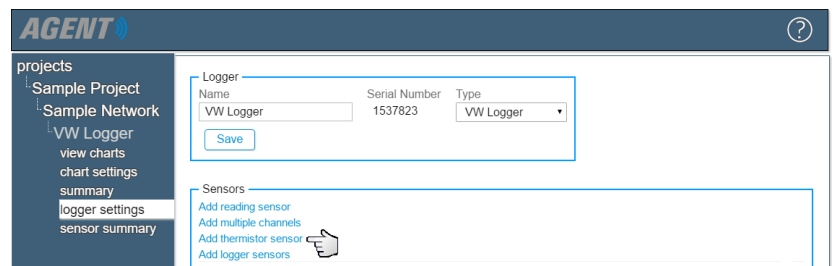


FIGURE 32: Add Thermistor Sensor

The **Edit Sensor** dialog opens (Figure 33). Table 11 describes the available thermistor settings.

FIGURE 33: Edit Thermistor Sensor

Label	Description
Type	See Table 10 on page 22.
Start/End Date	See Table 10 on page 22.
Choose a Color	See Table 10 on page 22.

TABLE 11: Descriptions for Thermistor Sensors

When a Sensor is created, it is added to the list of sensors on the Logger Settings screen (Figure 34).

FIGURE 34: Thermistor Sensor Added

Access the sensor settings at any time by selecting the name of the sensor.

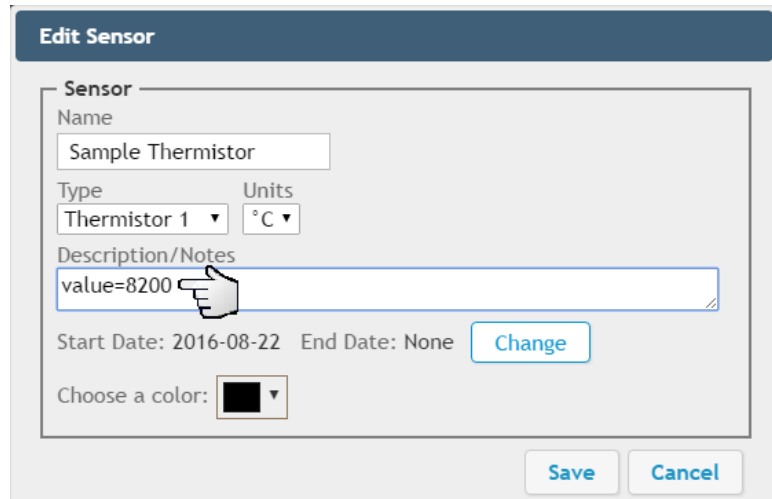
The **Alerts** column is used to create alerts that are displayed on the View Charts and Live Charts screens when user defined criteria are exceeded. For information on alerts, see *Section 6*.

To delete a sensor, select **remove**.

3.7.2.1 HIGH TEMPERATURE (HT) SENSORS

GEOKON's high temperature sensors use a different thermistor than standard sensors. When a high temperature sensor or thermistor is used, the thermistor value must be set using the **Description/Notes** field. For 8.2k Ω resistance thermistors, enter **value=8200**. For 10k Ω resistance thermistors,

enter **value=10000**. Figure 35 shows an example of setting the value for 8.2k thermistors.



The image shows a software interface titled "Edit Sensor". It contains several input fields and buttons. The "Name" field is "Sample Thermistor". The "Type" dropdown is "Thermistor 1" and the "Units" dropdown is "°C". The "Description/Notes" text area contains "value=8200" with a mouse cursor pointing to it. Below this are "Start Date: 2016-08-22" and "End Date: None" with a "Change" button. At the bottom is a "Choose a color:" dropdown set to black. At the very bottom of the dialog are "Save" and "Cancel" buttons.

FIGURE 35: Changing Thermistor Value for HT Sensors

3.7.3 ADD MULTIPLE SENSORS

Add Multiple Sensors is designed to use with Multi-Channel Loggers and addressable sensors and is a convenient way to set up multiple sensors at one time. Select **Add Multiple Sensors** (Figure 36) to open the **Add Sensors** dialog (Figure 37).

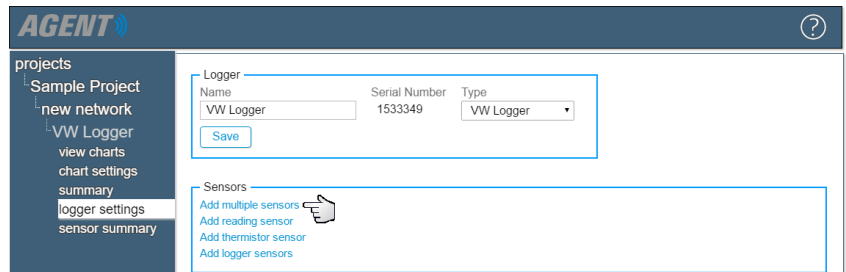


FIGURE 36: Add Multiple Sensors

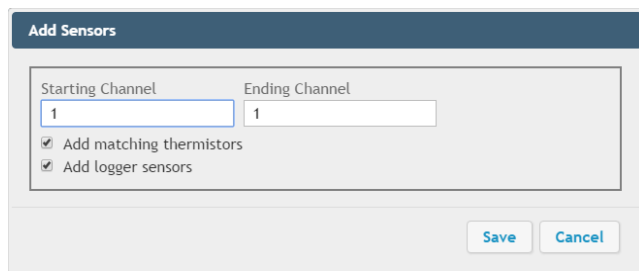


FIGURE 37: Add a Collection of Channels Dialogs

Enter the range of channels on the Logger that have a sensor wired into them. Channel numbers coincide with terminal blocks inside the Logger. Refer to the GeoNet manual for more information. If the sensors attached to the Logger have internal thermistors, check the **Add matching thermistors** box.

Checking the **Add Logger Sensors** box creates Battery, Logger Temperature, and Signal Strength sensors along with the reading sensors.

Figure 38 shows an example of adding channels one through four with matching thermistors and logger sensors.

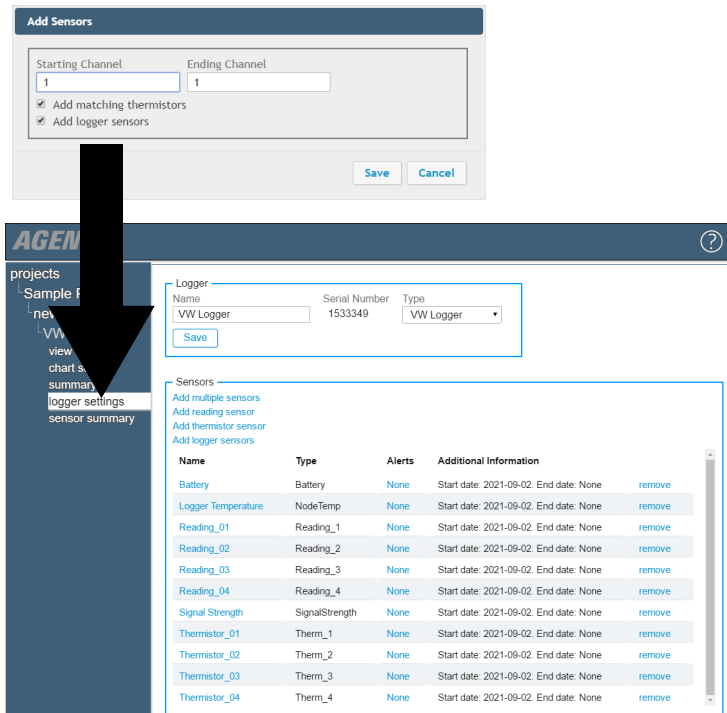


FIGURE 38: Multiple Reading and Thermistor Sensors Added

If more than one range is required, save the information and then repeat the process. Alternatively, add all the channels at once and then delete the unused channels after they are created.

3.7.4 LOGGER SENSORS

Logger sensors are for monitoring the health and status of the logger. To add a Logger sensor to the device, select **Add logger sensors** (Figure 39).

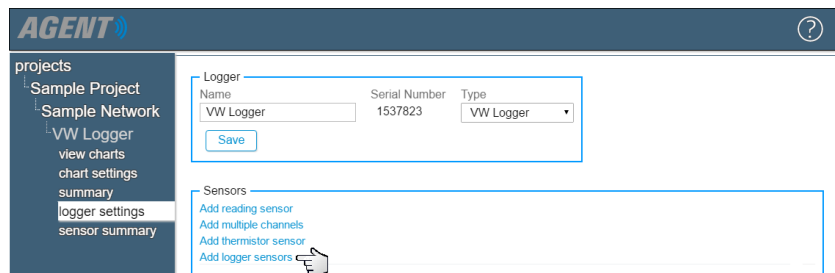


FIGURE 39: Add Logger Sensors

This opens the **Edit Sensor** dialog (Figure 40). To add a sensor, check the appropriate box. More than one sensor is added at a time by checking multiple boxes. When a sensor's box is checked, the information that coincides with that sensor can be edited. See Table 12 for more information.

FIGURE 40: Edit Logger Sensor

Label	Description
Start/End Date	See Table 10 on page 22
Choose a Color	See Table 10 on page 22

TABLE 12: Description for Logger Sensors

After saving, the selected sensors are added to the list of sensors on the Logger Settings screen (Figure 28).

FIGURE 41: Logger Sensors Added

Access the sensor settings at any time by selecting the name of the sensor.

The **Alerts** column is used to create alerts that are displayed on a chart when user defined criteria are exceeded. For information on alerts, see *Section 6*.

To delete a sensor, select **remove**.

3.7.5 TILT SENSORS

3.7.5.1 ADDING TILT (ANGLE) SENSORS

To add a tilt angle sensor, select **Add Tilt Sensors (angle)** (Figure 42).

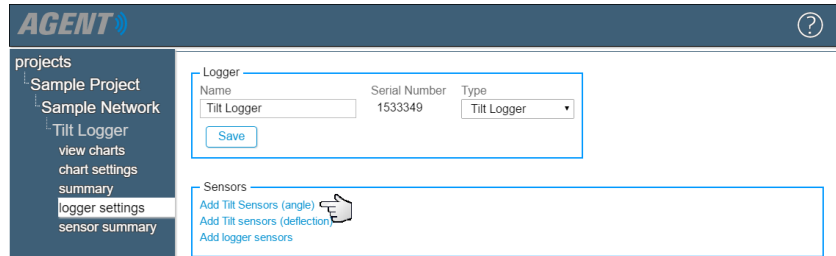


FIGURE 42: Add a Tilt Angle Sensor

This opens the **Edit Angle MEMS** dialog (Figure 43).

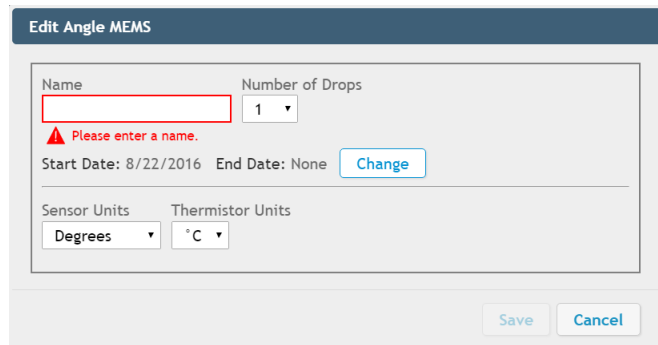


FIGURE 43: Edit Angle MEMS Dialog

Table 12 describes the available settings.

Label	Description
Number of Drops	Select the number of sensors in the string (32 maximum).
Start/End Date	See Table 10 on page 22

TABLE 13: Descriptions for Edit Angle MEMS Dialog

When a Sensor is created, it is listed on the Logger Settings screen as shown in Figure 28.

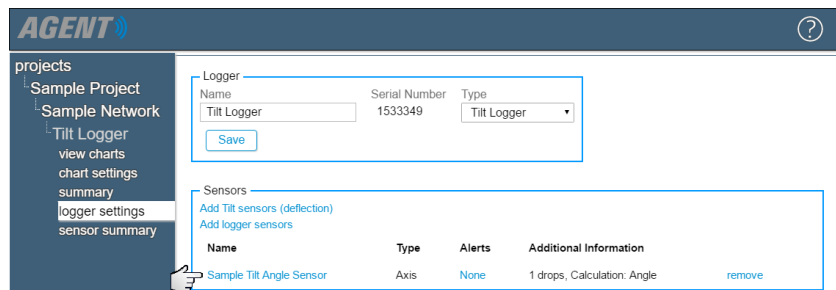


FIGURE 44: Tilt Angle Sensor Added

Access the sensor settings at any time by selecting the name of the sensor. Additional settings are available for MEMS sensors after the sensor is created. These settings are described in Sections 3.7.5.3 through 3.7.5.9.

The **Alerts** column is used to create alerts that are displayed on the View Charts and Live Charts screens when user defined criteria are exceeded. For information on alerts, see *Section 6*.

To delete a sensor, select **remove**.

3.7.5.2 ADDING TILT (DEFLECTION) SENSORS

To add MEMS Deflection Sensors, select **Add Tilt Sensors** (deflection) (Figure 45).

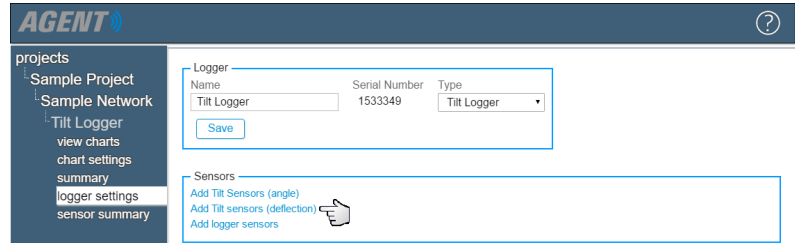


FIGURE 45: Add a Tilt Deflection Sensor

This opens the **Edit Deflection MEMS** dialog (Figure 46). Table 14 describes the available settings.

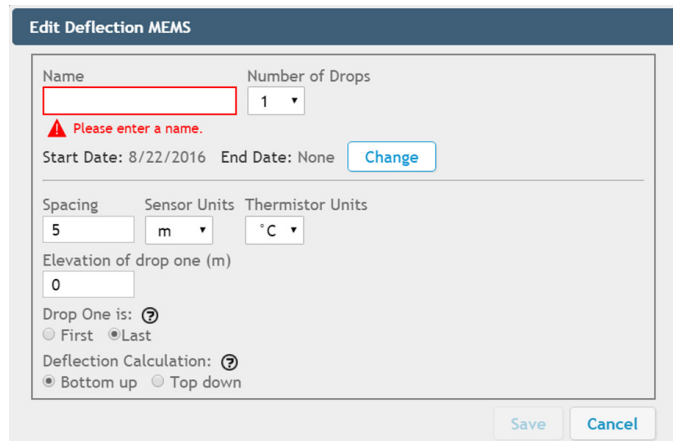


FIGURE 46: Edit Deflection MEMS Dialog

Label	Description
Number of Drops	Select the number of Sensors in the String (32 maximum).
Start/End Date	See Table 10 on page 22
Spacing	This field along with the Sensor Units field defines the distance between the drops.
Elevation of drop one (m)	Input the distance to drop one of the string in Meters.
Drop One is:	Indicates if the sensor being dedicated as drop one is at the top or the bottom of the string.
Deflection Calculation	Select whether the deflection is calculated from the bottom up or from the top down.

TABLE 14: Descriptions for Edit Deflection MEMS Dialog

When a Sensor is created, it is listed on the Logger Settings screen (Figure 28).

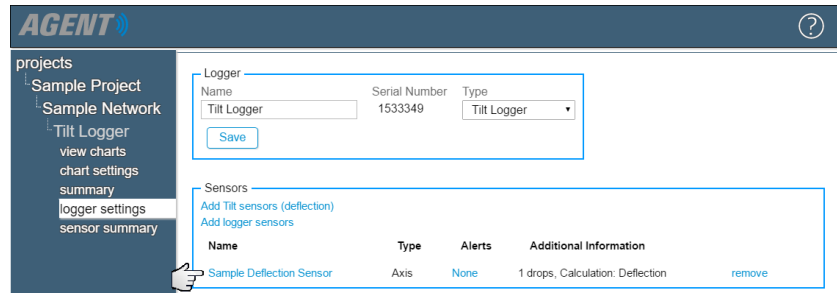


FIGURE 47: Tilt Deflection Sensor Added

Access the string settings at any time by selecting the name of the sensor. Additional settings are available for tilt sensors after the sensor is created. These settings are described in the *Section 3.7.5.3* through *Section 3.7.5.9*.

The **Alerts** column is used to create alerts that are displayed on the View Charts and Live Charts screens when user defined criteria are exceeded.

For information on alerts, see *Section 6*. To delete a sensor, select [remove](#).

3.7.5.3 EDIT A TILT SENSOR

To edit a Tilt Sensor, select the name of the desired sensor (Figure 48).

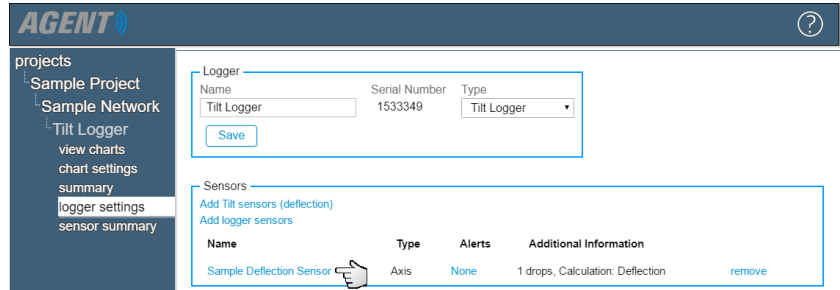


FIGURE 48: Select a Tilt Sensor to Edit

This opens the **Edit MEMS String** dialog (Figure 49).

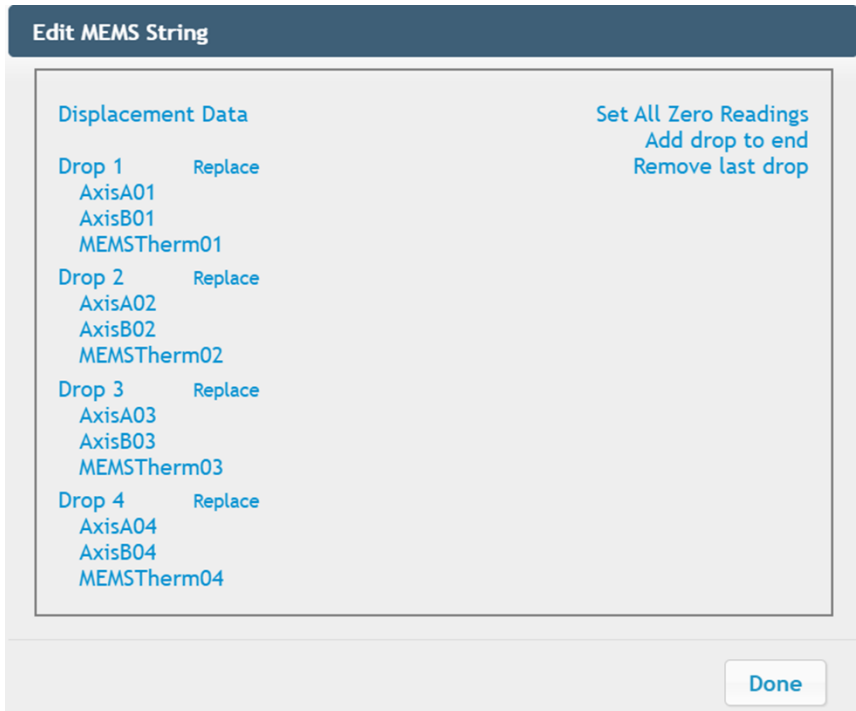


FIGURE 49: MEMS Sensor Settings

The **Edit MEMS string** dialog is navigated by using the tree on the left side of the screen. At the top of the tree is the sensor name, followed by a list of drops, with the A and B axis listed below each drop. Selecting an item in the tree opens the settings for that specific item.

Selecting the sensor name opens a **Edit MEMS** dialog similar to the one that was used to add the sensor. See *Section 3.7.5.1* and *Section 3.7.5.2* above for descriptions of these settings.

NOTE: When editing an existing string, the **Number of drops** setting is not available. To change the number of drops in a string, use **Add drop to end** or **Remove last drop** as explained in the next section.

3.7.5.(SET ALL ZERO READINGS

Click **Set All Zero Readings** (Figure 51) to open a dialog that allows you to select a reading taken by the sensors to use as the zero reading for all sensors in the string.

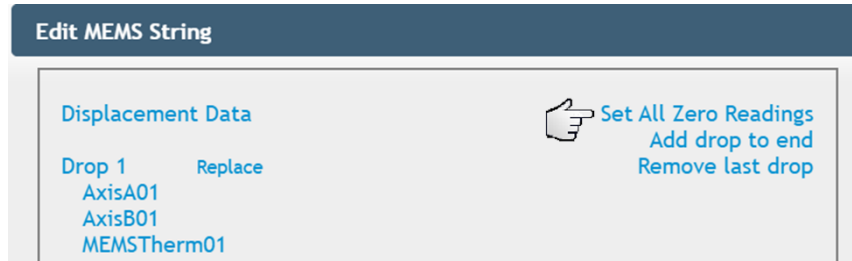


FIGURE 50: Set All Zero Readings

3.7.5.5 ADD OR REMOVE A DROP

The number of drops in the sensor must match the number of drops in the MEMS hardware or no data is displayed. The number of drops is changed by selecting one of the links in the top right corner of the **Edit MEMS String** dialog (Figure 51).

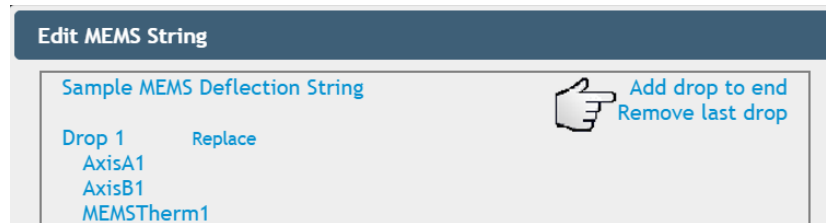


FIGURE 51: Add or Remove a Drop

Drops are added to the end of the string, one at a time, by selecting **Add drop to end**. MEMS strings can have a maximum of 16 drops. When the maximum number of drops is reached, the **Add drop to end** link disappears. The link reappears if a drop is removed so that the string has less than the maximum allowed.

Drops are deleted from the end of the string, one at a time, by selecting **Remove last drop**. If there is only one drop left on the string, the **Remove last drop** link disappears. The link reappears if a drop is added so that the string has more than the minimum allowed.

3.7.5.6 DROP SETTINGS

Selecting the name of a drop (Figure 52) opens the **Edit MEMS Drop** dialog (Figure 53).



FIGURE 52: Select the Drop Name

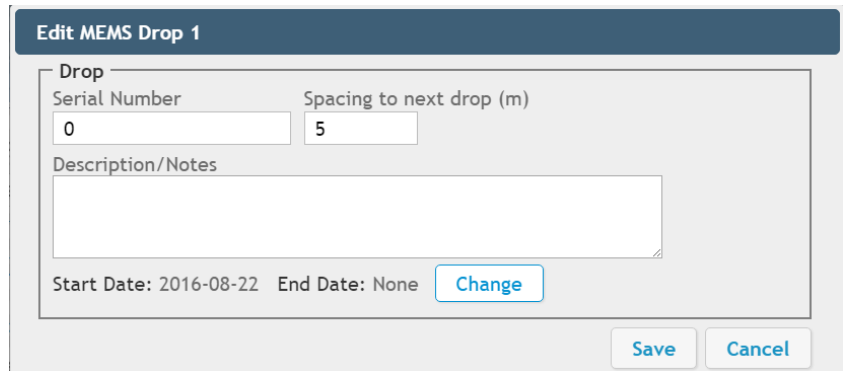


FIGURE 53: Edit MEMS Drop Dialog

Drop settings are as follows:

Label	Description
Serial Number	Enter the serial number of the drop. This is not required, but it is recommended to help the user differentiate drops.
Spacing to Next Drop	Input the distance between the selected drop and the next drop in the string.
Start/End Date	See Table 10 on page 22

TABLE 15: Drop Settings

3.7.5.7 AXIS SETTINGS

Selecting the name of an axis (Figure 54) opens the **Edit Sensor** dialog for that axis (Figure 55).

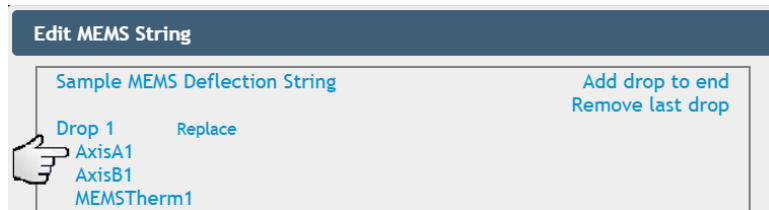


FIGURE 54: Select the Axis Name

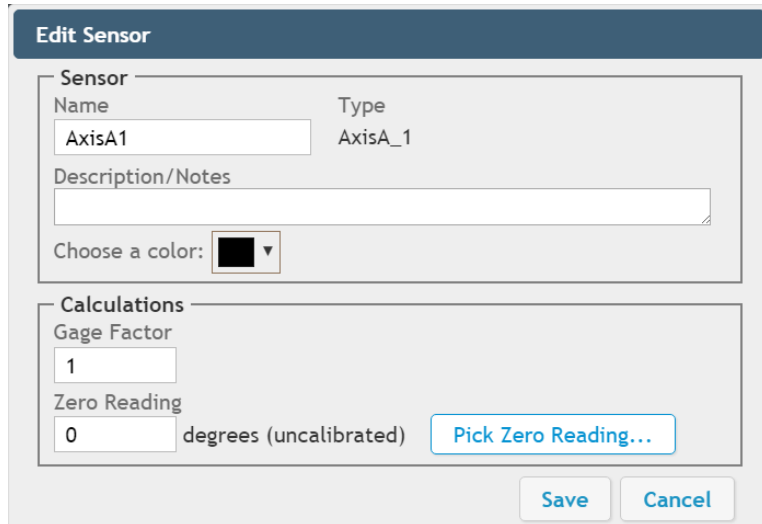


FIGURE 55: Axis Settings

Axis settings are as follows:

Label	Description
Type	Static field showing the axis letter and drop number.
Choose a Color	See Table 10 on page 22.
Gauge Factor	All MEMS sensors are added with a nominal gauge factor of one. Consult the calibration sheet for the sensor if you wish to apply a gauge factor. Model 6180 inclinometers and Tilt Loggers with serial number greater than 2047508 provide calibrated output and do not require post processing.

Label	Description
Zero Reading	Enter the initial onsite zero reading. It is highly recommended that an accurate initial zero reading is obtained for each sensor, as this reading is used for all subsequent data reduction. Consult the sensor manual for more information. Note: setting the zero readings causes MEMS deflection charts to display the deflection from the specified zero line, rather than as a profile of the borehole. See <i>Section 5.3.2</i> for more information on MEMS deflection charts.
Pick Zero Reading...	Opens the Pick Zero Reading dialog, which is used to select a reading downloaded from the network to use as the sensor's Zero Reading .

TABLE 16: Descriptions for Axis Settings

3.7.5.8 THERMISTOR SETTINGS

Selecting the name of a thermistor (Figure 56) opens the **Edit Sensor** dialog for that thermistor (Figure 57).

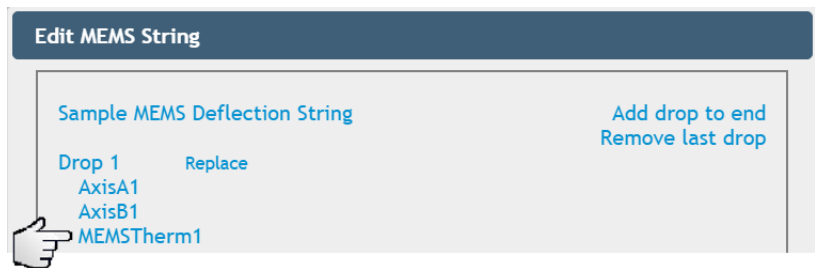


FIGURE 56: Select the Thermistor Name

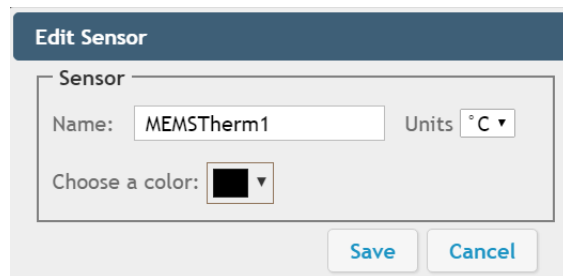


FIGURE 57: Thermistor Settings

TABLE 16:

3.7.5.9 REPLACING A DROP

Replacing a drop allows one drop to replace another in the Agent program. Use this feature when one MEMS sensor is swapped for another in the field. When a drop is replaced in the program, the following occurs:

- The **End Date** for the old drop is set to the current date.
- The old drop is detached from the string in the database, which means it can no longer be selected.

- Spacing from the old drop is transferred to the new drop.

To replace a drop, select the **Replace** link next to the drop name (Figure 58).

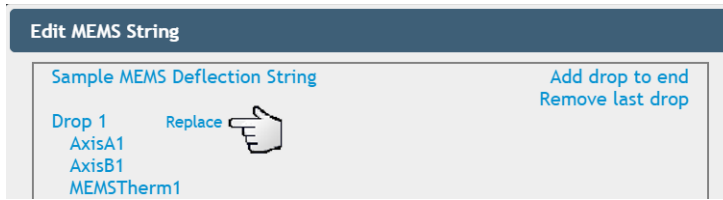


FIGURE 58: Replace a Drop

This brings up the **Replace MEMS Drop** dialog (Figure 59).

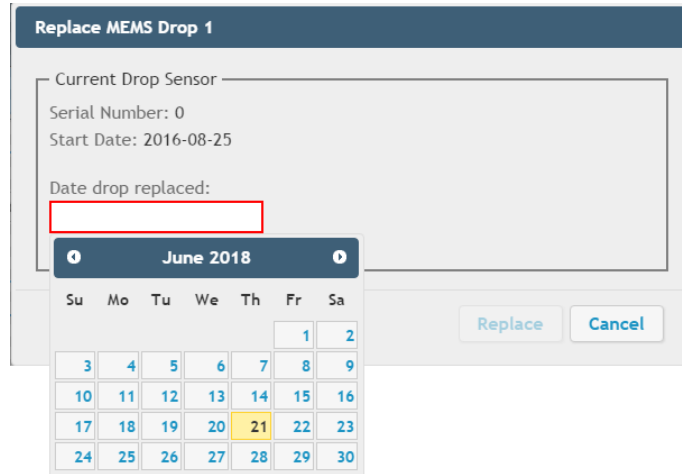


FIGURE 59: Replace MEMS Drop Dialog

Choose the date the drop was replaced and then select **Replace**. When the replacement date is confirmed, edit the serial number and other details of the drop to match the new drop.

Selecting **Cancel** closes the dialog and return the settings to their previously saved configuration.

3.7.6 TWO-AXIS TILT METER

Two-axis tilt meter sensors should only be used with Loggers that have a two-axis MEMS tiltmeter installed inside the enclosure at the factory.

To add a two-axis tilt meter sensor to a device, go to the Logger Settings screen as described in Section 3.7, then select **Add 2 axis tilt meter** (Figure 60).

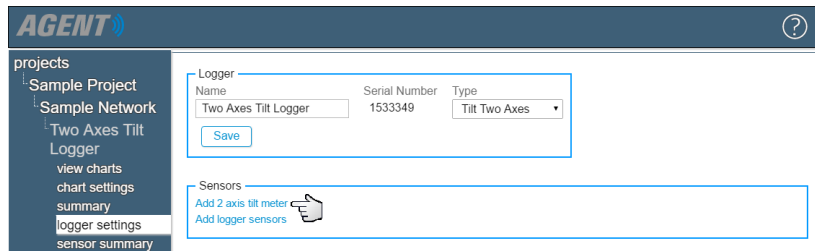


FIGURE 60: Add Two Axis Tilt Meter Sensor

This opens the **Edit Tilt Meter Header** dialog (Figure 61).

FIGURE 61: Edit Tilt Meter Header

Table 17 describes the available settings.

Label	Description
Start/End Date	See Table 10 on page 22

TABLE 17: Descriptions for Two Axis Tilt Meter Sensors

When the tilt sensor is created, it appears on the Logger Settings screen (Figure 62).

FIGURE 62: List of Tilt Sensors

The **Alerts** column is used to create alerts that are displayed on the View Charts and Live Charts screens when user defined criteria are exceeded. For information on alerts, see *Section 6*.

To delete a sensor, select [remove](#).

Additional settings for the two-axis tilt meter sensor are accessed by selecting the name of the tilt sensor. This opens the **Edit Tilt Sensor** dialog (Figure 63).

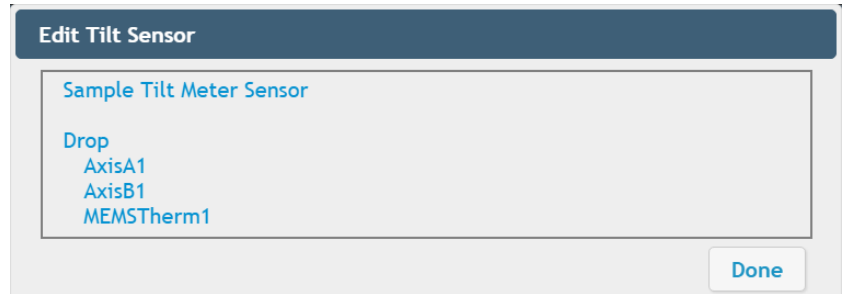


FIGURE 63: Tilt Sensor Settings

The **Edit Tilt Sensor** dialog is navigated by using the tree on the left side of the screen. Selecting any of the items in the tree opens the settings for that specific item. Refer to the sections below for more information.

3.7.6.1 SENSOR SETTINGS

Selecting the sensor name (Figure 64) opens the **Edit Tilt Meter Header** dialog (Figure 65). This dialog is similar to the one used to create the sensor, however, when editing an existing sensor there are fewer settings available.



FIGURE 64: Select the Sensor Name

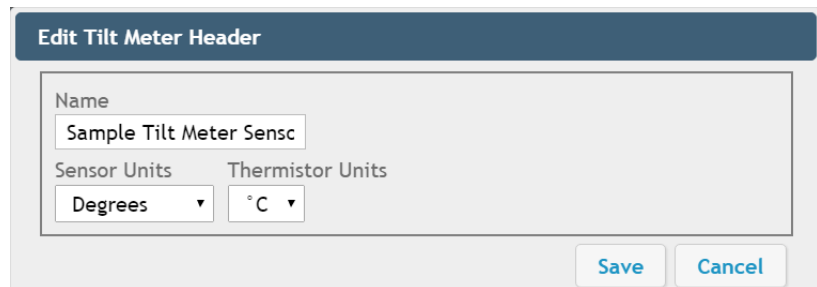


FIGURE 65: Edit Tilt Meter Header

3.7.6.2 DROP SETTINGS

Selecting **Drop** (Figure 66) opens the **Edit MEMS Drop** dialog (Figure 67).

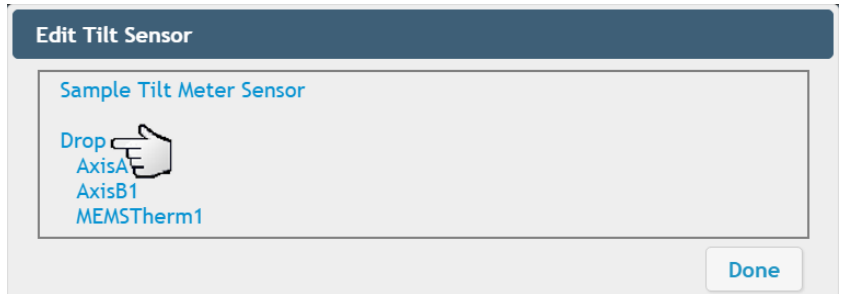


FIGURE 66: Select Drop

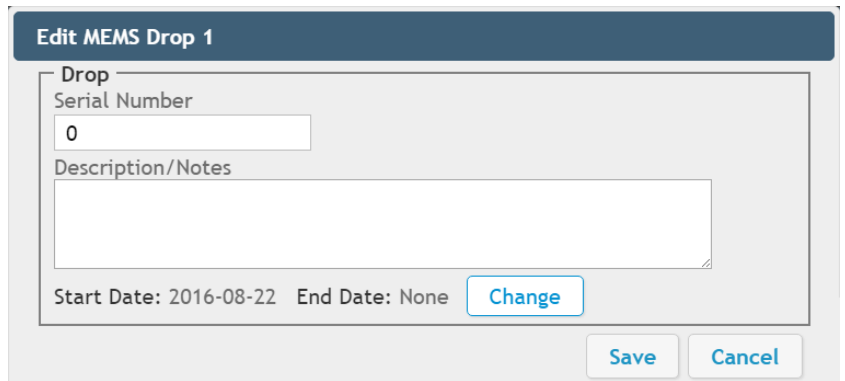


FIGURE 67: Edit MEMS Drop Dialog

Label	Description
Serial Number	Enter the serial number of the drop. This is not required, but it is recommended to help the user differentiate drops.
Start/End Date	See Table 10 on page 22

TABLE 18: Drop Settings

3.7.6.3 AXIS SETTINGS

Selecting the name of an axis (Figure 68) opens the **Edit Sensor** dialog for that axis (Figure 69).



FIGURE 68: Select Axis Name

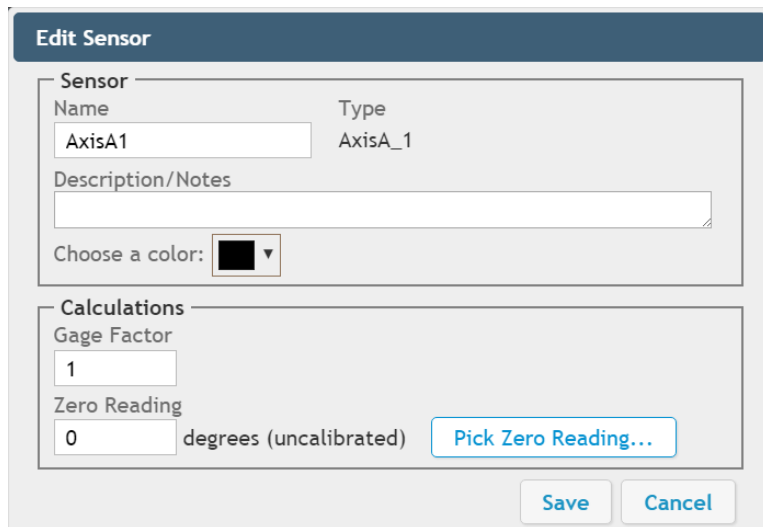


FIGURE 69: Axis Settings


Label	Description
Type	Static field showing the axis letter and drop number (AxisB_3 = the B axis of drop three.)
Choose a Color	See Table 10 on page 22.
Gauge Factor	All MEMS sensors are added with a nominal gauge factor of one, nominally. Please contact GEOKON for more information.
Zero Reading	Enter the initial onsite zero reading. It is <i>highly recommended</i> that an accurate initial zero reading is obtained for each sensor, as this reading is used for all subsequent data reduction. Consult the sensor manual for more information.
	Opens the Pick Zero Reading dialog, which is used to select a reading downloaded from the Network that is used as the sensor's Zero Reading .

TABLE 19: A or B Axis Settings

3.7.6.4 THERMISTOR SETTINGS

Selecting the name of a thermistor (Figure 70) opens the **Edit Sensor** dialog for that thermistor (Figure 71).

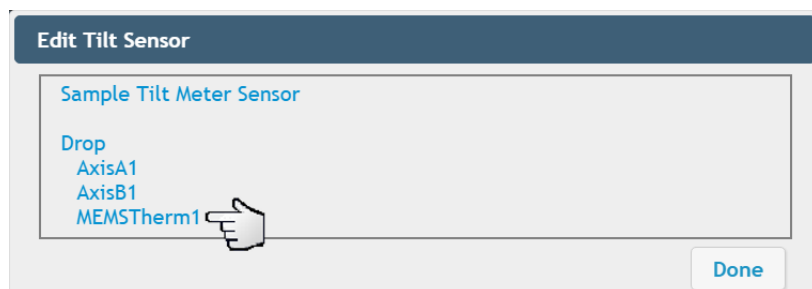


FIGURE 70: Select the Thermistor Name

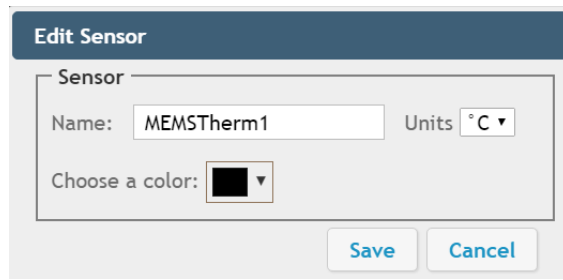


FIGURE 71: Thermistor Settings

Thermistor Settings are as Follows:

Label	Description
Choose a Color	See Table 10 on page 22.

TABLE 20: Thermistor Settings

3.8 EXPORT NETWORK DATA

Data export is done manually or automatically. To export data, select a Network to export, and then select **export** (Figure 72).

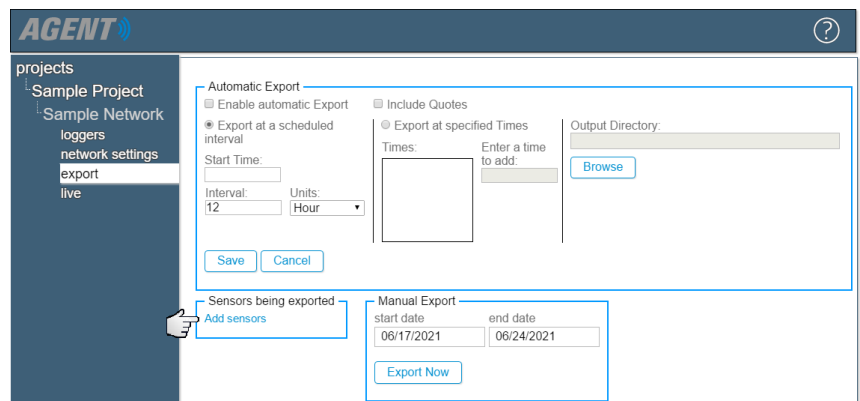


FIGURE 72: Export Screen

The export file contains data from sensors added to the **Sensors being exported** list. If there are no sensors in the list no export file is created. To add sensors, select **Add sensors** (Figure 73).

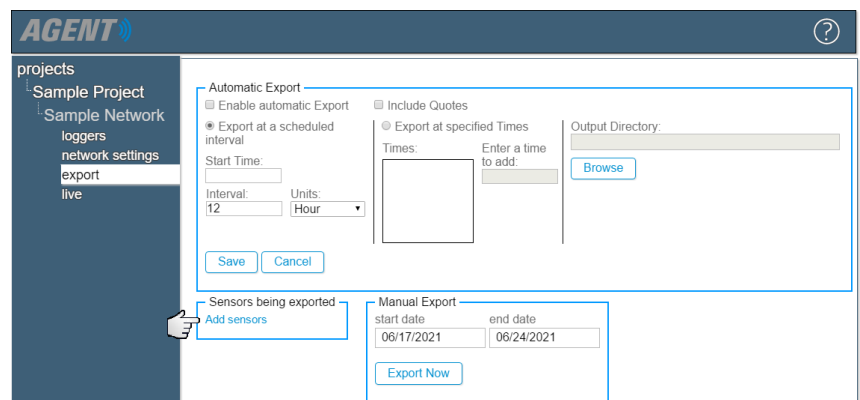


FIGURE 73: Add Sensors to Export

This opens the **Add Sensors to Export** dialog, which lists all the sensor created for the Network (Figure 74).

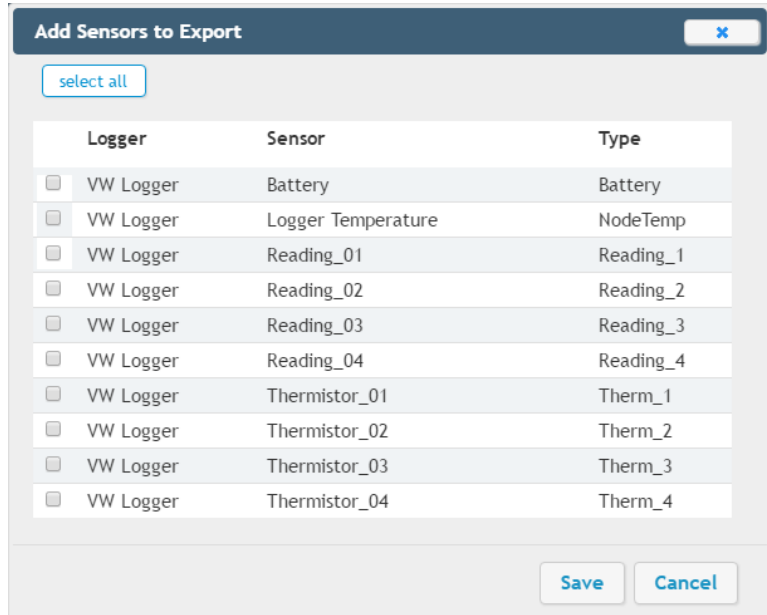


FIGURE 74: Select Sensors for Export

Select the sensors to export by selecting the check box next to the desired sensors or use the **select all** button to include all sensors on the network.

After selecting the sensors to export, select **Save**. To close the dialog without making any changes select **Cancel**.

Sensors that were added are shown in the **Sensors being exported** box (Figure 75).

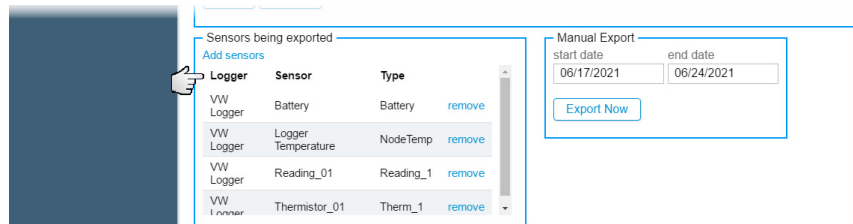


FIGURE 75: Sensors Being Exported

To remove a sensor from the export list, select **remove**.

3.8.1 AUTOMATIC EXPORT

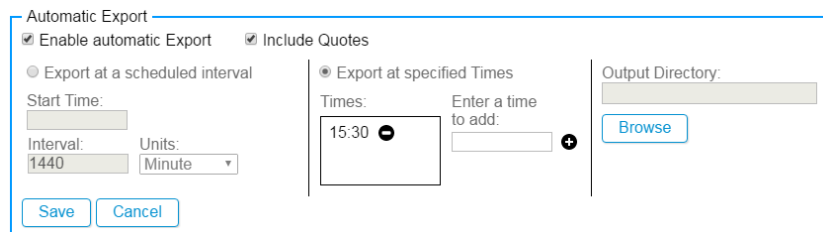


FIGURE 76: Automatic Export

The automatic export feature of Agent is designed to work with data management programs like Vista Data Vision®. The data file is saved with a

***.dat** extension. Most computers prompt the user to choose a program to open this type of file.

Data is exported to the same file each time an export occurs. A new file is only created after adding or removing a Logger, chart, or sensor, or changing the sensor mapping. In these cases, in order to maintain the historical structure of the data, the previous file is given the extension ***.bad** and a new ***.dat** file is created.

Table 21 describes the available automatic export settings.



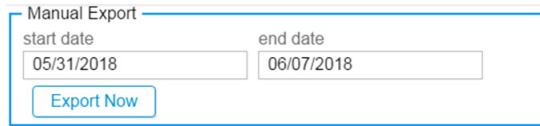
Label	Description
Enable Automatic Export	Check or uncheck this box to enable/disable automatic export.
Include Quotes	Contains everything between the delimiters with quotes. Regions that use alternate date formats or commas as decimal points may require this for import of the file into other programs.
Export at a scheduled interval	Select this option to have data exported at regular intervals. The first export occurs at the specified Start time . Enter the desired start time in 24-hour format. For example, 3:30 PM becomes 15:30. Data download recurs based on the information entered in the Interval and Units fields.
Export at specified Times	Select this option to set specific times of the day for the data to export. Enter a time in 24-hour format (3:30 PM becomes 15:30) in the Enter a time to add field and then select the  icon to add it to the list of download Times . To remove a download time from the list, select the corresponding  icon next to the time to remove.
Output Directory	Determines how the file is saved. To set the Output Directory, select browse .

TABLE 21: Automatic Download Settings

3.8.2 MANUAL EXPORT



Manual Export

start date: 05/31/2018 end date: 06/07/2018

[Export Now](#)

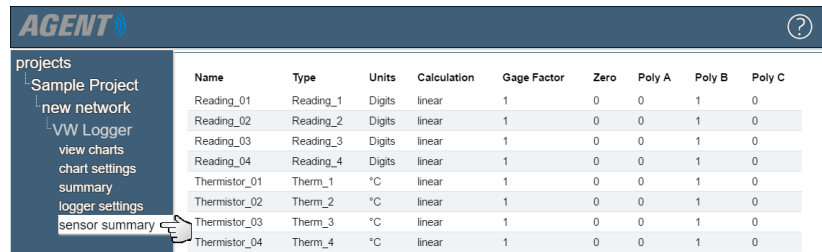
FIGURE 77: Manual Export

Manual export is a onetime download of data for the specified date range. The completed file displays sensor data in columns, the order of which is based on the **Sensors being exported** list. The header of each column shows the serial number of the Logger or Gateway the sensor is associated with, followed by the sensor type.

Select [Export Now](#) to begin the export. When the data is exported, Agent prompts the user to choose a location for the file. Choose the desired directory and then select save. The exported data file is saved with a ***.csv** extension.

3.9 SENSOR SUMMARY

The Sensor Summary screen (Figure 77) allows the user to view the vital information for all sensors associated with the logger in one convenient place.



AGENT


projects

- Sample Project
- new network
- VW Logger
- view charts
- chart settings
- summary
- logger settings
- sensor summary

Name	Type	Units	Calculation	Gage Factor	Zero	Poly A	Poly B	Poly C
Reading_01	Reading_1	Digits	linear	1	0	0	1	0
Reading_02	Reading_2	Digits	linear	1	0	0	1	0
Reading_03	Reading_3	Digits	linear	1	0	0	1	0
Reading_04	Reading_4	Digits	linear	1	0	0	1	0
Thermistor_01	Therm_1	°C	linear	1	0	0	1	0
Thermistor_02	Therm_2	°C	linear	1	0	0	1	0
Thermistor_03	Therm_3	°C	linear	1	0	0	1	0
Thermistor_04	Therm_4	°C	linear	1	0	0	1	0

FIGURE 78: Sensor Summary Screen

4. LC2 DATALOGGERS

It is assumed that all relevant LC2 hardware has already been installed, the LC2 has been connected to the computer, and all device drivers have been installed correctly. For information regarding installation of LC2 dataloggers, please consult the appropriate LC2 instruction manual. Relevant instruction manuals can be accessed inside the Agent program by selecting the  icon in the top right corner of the screen.

4.1 ADD AN LC2 DATALOGGER

To add an LC2 datalogger to a Project, select a Project (Figure 79) and then select **add lc2** on the left side of the screen (Figure 80).

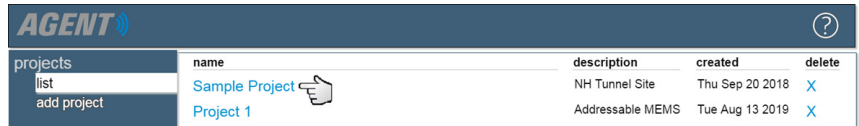


FIGURE 79: Select a Project

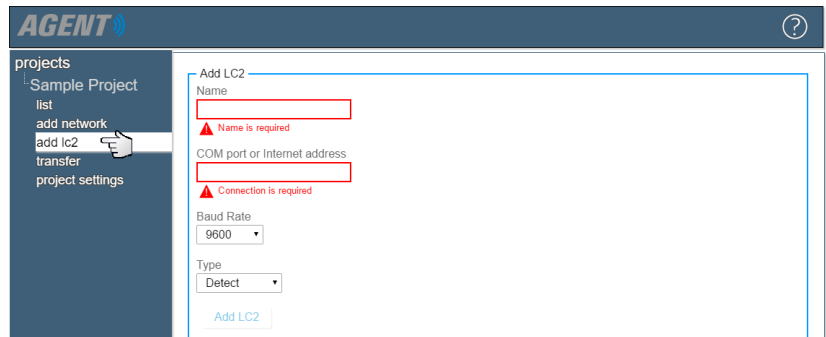


FIGURE 80: Add LC2 Screen

1. Enter a descriptive name for the LC2 datalogger.
2. Enter the COM port for wired connections, or the internet address for wireless connections. See below for details. To add an LC2 without connecting to it, see *Section 4.1.3*.

Wired Connections: Type **COM** into the **COM port or internet address** field. Agent displays a list of active COM ports. Choose the correct port from the list (Figure 81) or type in the full name of the desired COM port.

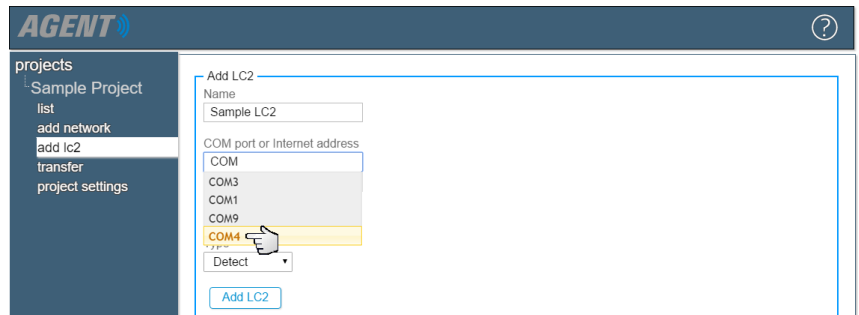


FIGURE 81: COM port for Wired Connection

If the correct COM port does not display in Agent, close the program, make sure the LC2 is powered on and the cable connection is secure, and then try again. If unsure of which COM port the LC2 is utilizing, refer to the information in Appendix A.

Wireless Connections: If connecting wirelessly to the LC2 via an exterior (add on) networked device, enter the device URL or IP address into the **COM port or internet address** field (*Figure 82*). An IP address must contain a colon after the address, followed by the port (10.1.7.91:5555.) **Note:** port 5555 is only a placeholder and not the port that will be used. The port used will be designated by the connected device.

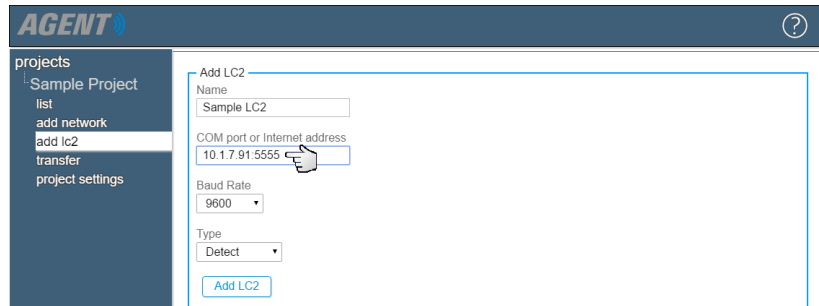


FIGURE 82: Internet Address for Wireless Connection

When connecting with a serial server or cellular modem it may be necessary for the Network administrator to set the IP address for local Networks. Cellular modems usually have a static IP address designated by the carrier.

3. For all new LC2 dataloggers, select the 9600 baud rate (*Figure 83*). A baud rate of 9600 is required for single channel LC2 dataloggers running firmware prior to version 5.2.X and for multichannel LC2 dataloggers running firmware prior to version 3.1.X.

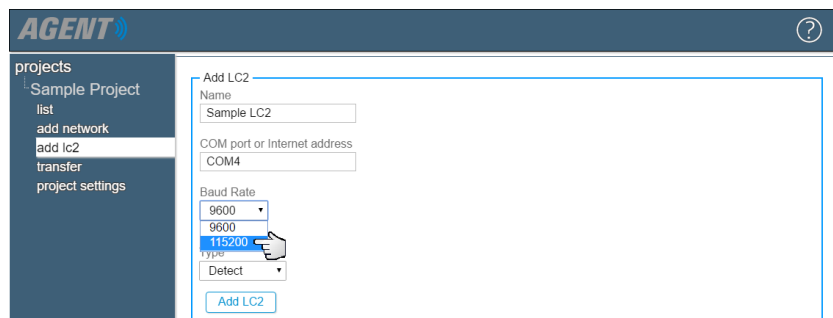


FIGURE 83: Select a Baud Rate

4. The **Type** should be left as **Detect** unless the LC2 is not able to communicate with Agent (the user does not have the unit and cannot connect to it remotely) in which case, follow the instructions in *Section 4.1.3*.
5. Select **Add LC2**. Agent connects to the LC2 and then go to the **General** LC2 Settings. See *Section 4.1.3* for more information.

If the LC2 was previously used with Agent or **LogView**, or other software, the user is given the chance to upload previously collected data and other settings. Refer to *Section 4.1.1* for dataloggers previously connected to Agent, and to *Section 4.1.2* for those previously connected to LogView.

If Agent fails to establish a connection, an error message appears stating the reason for the failure. Should this occur, make sure the COM port or internet address is correct, the LC2 is powered on, and the cable connection is secure; then try again.

If the LC2 does not connect after the above suggestions have been tried, it may be because the baud rate setting of the LC2 has been altered. Select the secondary baud rate option and try again.

4.1.1 ADDING LC2 DATALOGGERS PREVIOUSLY CONNECTED TO AGENT

If an LC2 datalogger was previously used with Agent software but is not currently in the Agent database (it was deleted from Agent, it was connected to a different computer, etc.) when Agent attempts to connect to the LC2, the dialog shown in *Figure 84* is displayed.

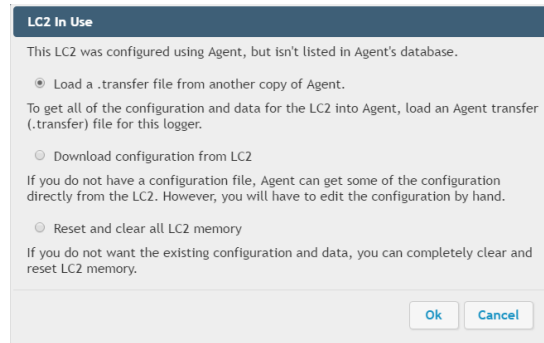


FIGURE 84: Agent Connection Exception

Option 1: If **Load a transfer file from another copy of Agent** is selected, Agent prompts the user to select a transfer file to load. The transfer file used should be from the Agent database the LC2 was previously saved in. See Section 7 for information on creating transfer files in Agent.

Option 2: If for some reason an Agent transfer file cannot be created, select **Download configuration from LC2**. Agent imports all LC2 settings that are attainable directly from the datalogger.

Option 3: If you do not wish to import any of the settings or data from the LC2, select **Reset and clear all LC2 memory**. Use with caution. *This is the equivalent of a factory reset. All stored data and settings is erased from the LC2.*

4.1.2 ADDING LC2 DATALOGGERS PREVIOUSLY CONNECTED TO LogView

If an LC2 datalogger was previously used with LogView Software, then when Agent attempts to connect to the LC2, the dialog shown in *Figure 85* is displayed.

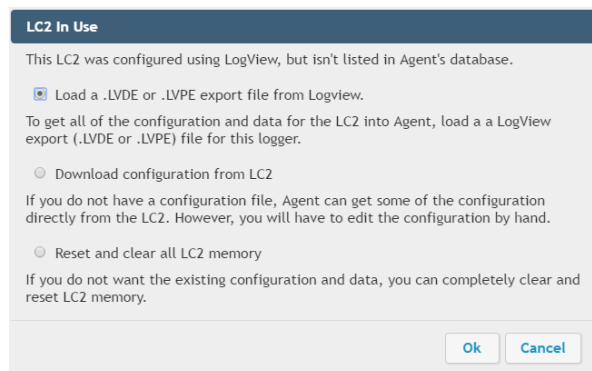


FIGURE 85: LogView Connection Exception

Option 1: If **Load a *.LVDE** or **LVPE** EXPORT FILE FROM LOGVIEW is selected, Agent prompts the user to select a LogView file to import.

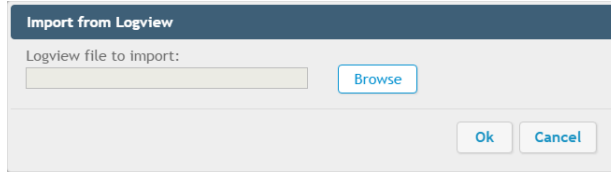


FIGURE 86: Import LogView File

Select **browse**, and then select a LogView file to import. LogView files with an ***.LVDE** file extension loads compatible settings and data from a single datalogger. LogView files with an ***.LVPE** file extension load compatible settings and data from an entire project.

To create an export file in LogView, right click on the datalogger or project you wish to export, then select **Logger to *.LVDE** file or **Project to *.LVPE** file. After exporting the file, return to Agent to continue creating the LC2.

Option 2: If for some reason a LogView ***.LVDE** file cannot be created, select **Download configuration from LC2**. Agent imports all LC2 settings that are attainable directly from the datalogger.

Option 3: If you do not wish to import any of the settings or data from the LC2, select **Reset and clear all LC2 memory**. Use with caution. *This is the equivalent of a factory reset. All stored data and settings is erased from the LC2.*

4.1.3 PREEMPTIVE LC2 CREATION (ADDING AN LC2 WITHOUT CONNECTING)

If an LC2 is not currently available to communicate with Agent (the user does not have the unit in hand and cannot connect to it remotely) it can still be added to Agent by following the steps outlined in this section.

1. Select a Project (*Figure 87*) and then select **add lc2** on the left side of the screen (*Figure 88*).



FIGURE 87: Selecting a Project

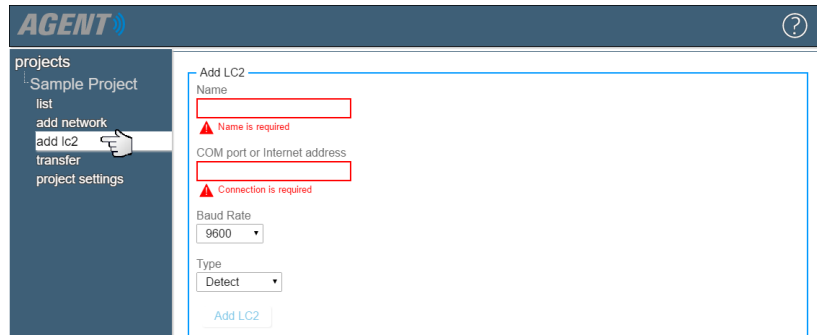


FIGURE 88: Add LC2 Screen

2. Enter a descriptive name for the LC2 datalogger.

- If the internet address* or COM Port the LC2 uses when it is connected is known, enter it now, otherwise enter a place holder, such as **COM0**.

***Note:** IP addresses must contain a colon after the address, followed by the port, e.g., 10.1.7.91:5555 (port 5555 is only a placeholder and not the port that will be used. The port used will be designated by the connected device.) When connecting with a serial server or cellular modem it may be necessary for the Network administrator to set the IP address for local Networks. Cellular modems usually have a static IP address designated by the carrier.
- For all new LC2 dataloggers, select the 9600 baud rate (*Figure 89*). A baud rate of 9600 is required for single channel LC2 dataloggers running firmware prior to version 5.2.X and for multichannel LC2 dataloggers running firmware prior to version 3.1.X.

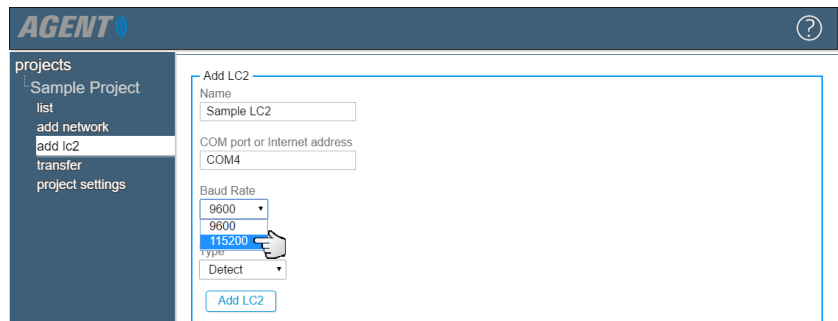


FIGURE 89: Select a Baud Rate

- Select the correct LC2 type from the drop-down (*Figure 90*). Use **single** for all 8002-1 models, **4 channel** for all 8002-4 models, and **16 channel** for all 8002-16 models. **Detect** can only be used when the LC2 is connected to the PC.)

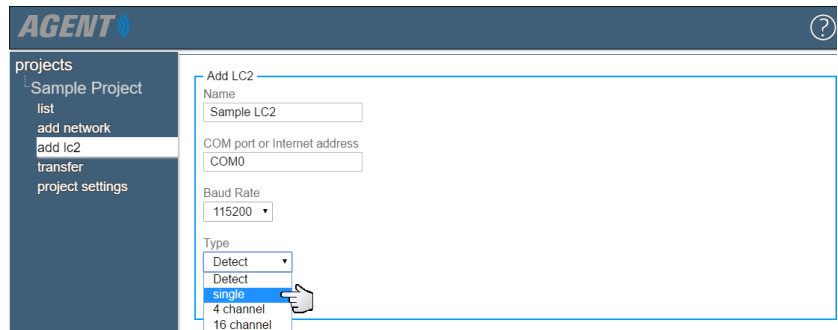



FIGURE 90: Select LC2 Type

- Select **Add LC2**. Agent creates the LC2 and then go to the **General LC2 Settings**. See *Section 4.4.1* for more information on General LC2 Settings. LC2 dataloggers that are created without being connected to the program are considered **Detached**.
- The **Detached** LC2 can now be set up as if it were connected to the program. Some Agent features require a connection (downloading data, sending commands, etc.) and do not function correctly until the LC2 has been **Attached** (connected) as described in the following section.

4.1.4 CONNECTING A DETACHED LOGGER

Detached loggers are LC2 dataloggers that were created without being connected to the program (as described in the previous section). When a **Detached** LC2 is available for connection, it needs to be **Attached** by following the steps below.

1. Go to the **General** LC2 settings by selecting the Project that contains the LC2 and then selecting the corresponding  icon (Figure 91).

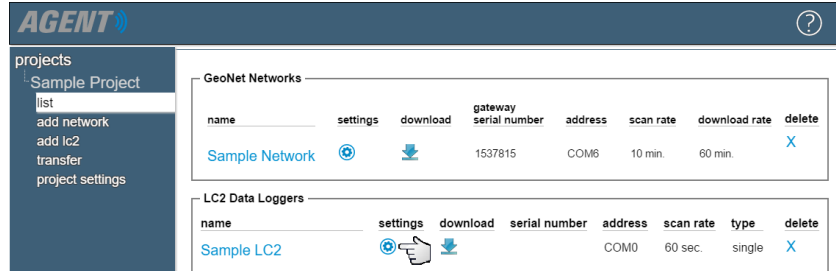


FIGURE 91: Select an LC2 Datalogger

2. Enter the COM port or internet address in the **Connection** field, see below for details.

Wired Connections: Type **COM** into the **Connection** field. Agent displays a list of active COM port Choose the correct port from the list (Figure 92) or type in the full name of the desired COM port.

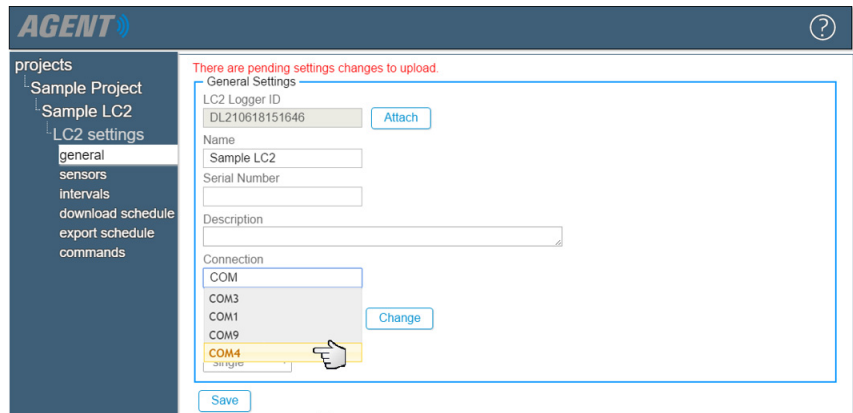


FIGURE 92: COM port for Wired Connections

If the correct COM port does not display in Agent, close the program, make sure the LC2 is powered on and the cable connection is secure, and then try again. If unsure of which COM port the LC2 is utilizing, refer to the information in Appendix A.

Wireless Connections: If connecting wirelessly to the LC2 using an exterior (add on) networked device, enter the device URL or IP address into the **Connection** field (Figure 93). An IP address must contain a colon after the address, followed by the port (10.1.7.91:**5555**).

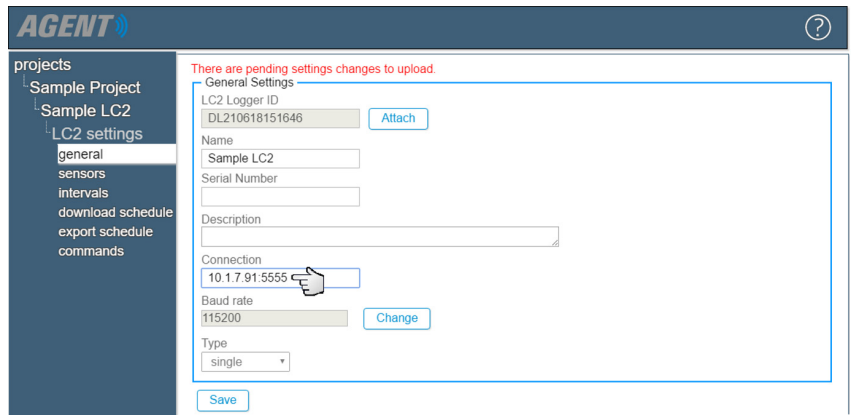


FIGURE 93: Internet Address for Wireless Connection

When connecting with a serial server or cellular modem it may be necessary for the Network administrator to set the IP address for local Networks. Cellular modems usually have a static IP address designated by the carrier.

3. Select **Attach**. Agent connects to the LC2 and then go to the Commands screen.

If the LC2 was previously used with Agent or LogView, or other software, the user is given the chance to upload previously collected data and other settings. Refer to *Section 4.1.1* for dataloggers previously connected to Agent, and to *Section 4.1.2* for those previously connected to LogView.

If Agent fails to establish a connection, an error message appears stating the reason for the failure. Should this occur, make sure the COM port or internet address is correct, the LC2 is powered on, and the cable connection is secure; then try again. If the LC2 still does not connect after the previous suggestions have been tried, it may be because the baud rate setting of the LC2 has been altered. Change the baud rate and try again.

4. In the Command screen, select **Upload settings** (Figure 94). This uploads the settings and other information that was set while the logger was **Detached** to the LC2.

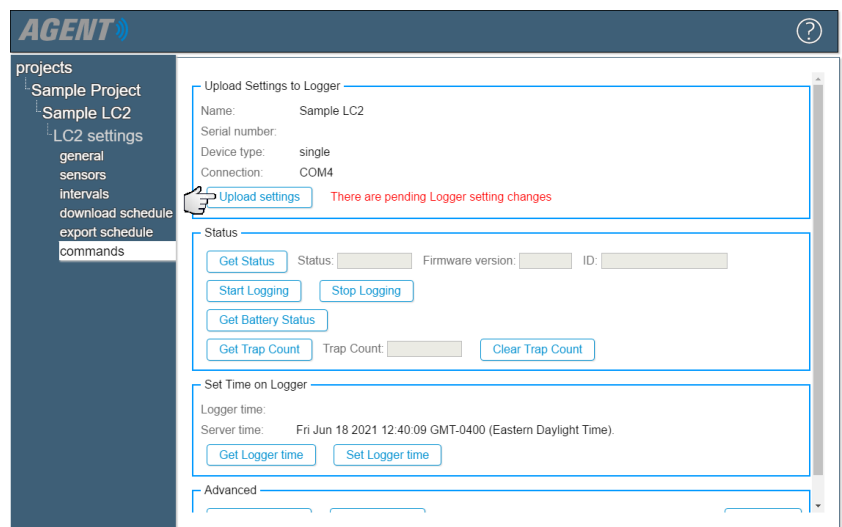


FIGURE 94: Upload Settings to the LC2

The logger setup is now complete. All Agent features can be used as normal.

4.2 LIST OF LC2 DATALOGGERS ASSOCIATED WITH A PROJECT

When Agent has successfully connected to an LC2, it is added to the Project. To view all the LC2 dataloggers associated with a Project, select **projects** on the left side of the screen, then select the name of the desired Project (Figure 95). This opens the List screen (Figure 96).

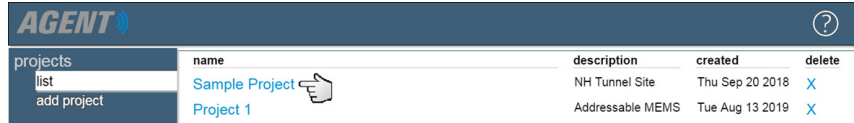


FIGURE 95: Select a Project

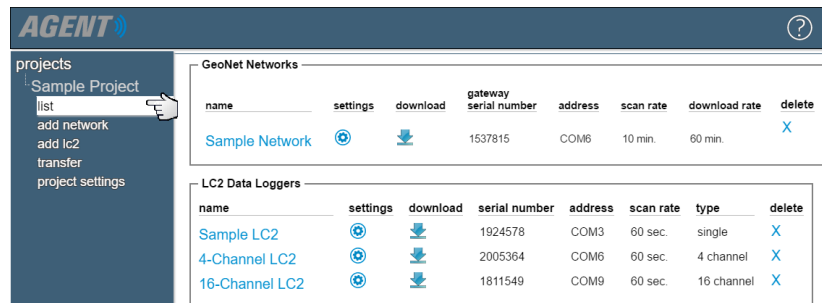


FIGURE 96: The List Screen

The available settings for LC2 Dataloggers on the List screen are described in Table 22 below.

Column Heading	Description
Settings	Select the ⚙️ icon to open the LC2 Settings screen. See Section 4.4.
Download	Select the ⬇️ icon to go to the Download screen. See Section 4.5 for more information on downloading.
Address	The method of connection used for the LC2. (COM port, URL, or IP address with port number). See Section 4.1.
Read Interval	See Table 1 on page 11
Type	Static field displaying the type of LC2 connected (how many channels it has.)
Delete	Select the X icon to delete the corresponding LC2. WARNING! Deleting an LC2 erases ALL data associated with the datalogger. It is highly recommended to create an Agent Transfer file before deleting the LC2.

TABLE 22: Descriptions for the LC2 List

4.3 LC2 MENU

To view the data, settings, charts, etc., for an LC2 datalogger, select a Project, then select the name of the desired LC2 datalogger (Figure 97).

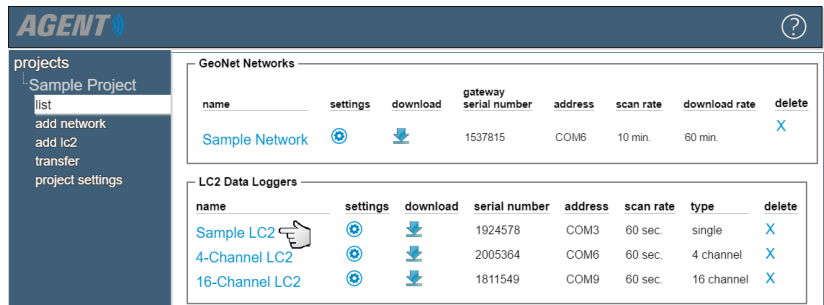


FIGURE 97: Select an LC2 Datalogger

Agent goes to the View Charts screen. The main menu for the LC2 is displayed on the left side of the screen (Figure 98).

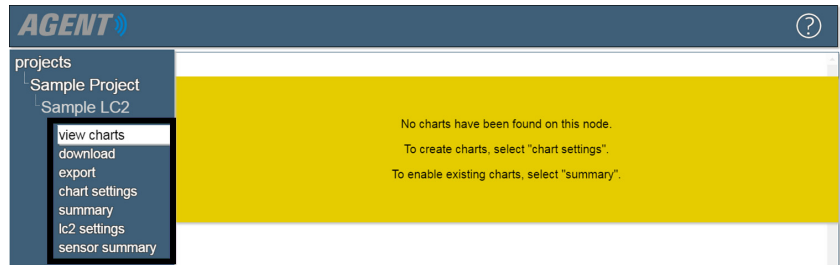


FIGURE 98: LC2 Menu (Left Side of the Screen)

The LC2 main menu items are covered by the following sections:

View Charts: View all charts associated with the LC2. See *Section 5* for information on working with Charts.

Download: Download data from the LC2. See *Figure 4.5*

Export: Export data to a file. See *Section 4.6*

Chart Settings: Controls which charts are displayed on the View Charts screen as well as in **Live Charts** See *Section 5* for information on working with charts.

Summary: Open the Chart Summary Screen. See *Section 5* for information on working with Charts.

LC2 Settings: Select to open the LC2 Settings Menu, see *Section 4.4*

Sensor Summary: Select to view a summary of the sensors associated with the LC2. See *Section 5.5*

4.4 LC2 SETTINGS MENU

To edit the settings of an LC2, select the Project that contains the LC2 and then select the icon that corresponds to the LC2 to be edited (Figure 99). The settings can also be accessed by selecting the name of the LC2 and then selecting **lc2 settings** on the left side of the screen.

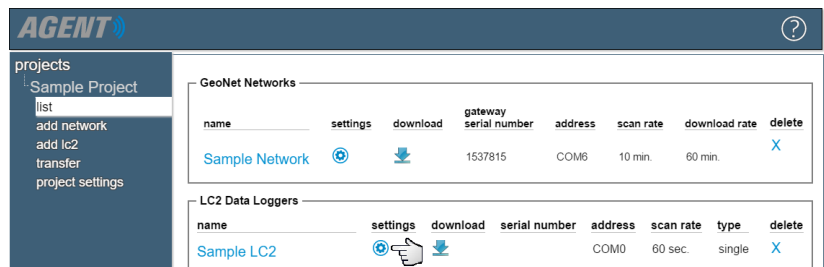


FIGURE 99: Select an LC2 Datalogger

Agent goes to the **General** LC2 Settings. The settings menu for the LC2 is displayed on the left side of the screen (Figure 100).

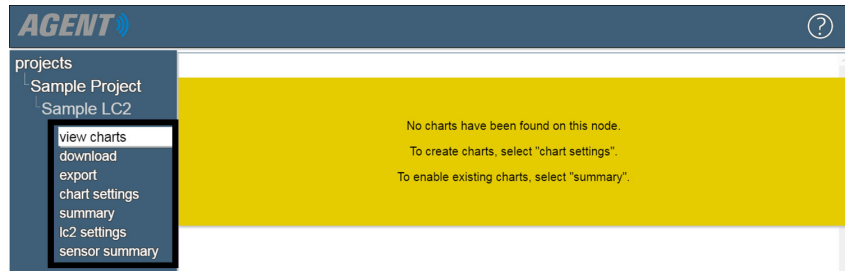


FIGURE 100: LC2 Settings Menu (Left Side of the Screen)

The LC2 settings menu is covered by the subsections that follow.

4.4.1 GENERAL

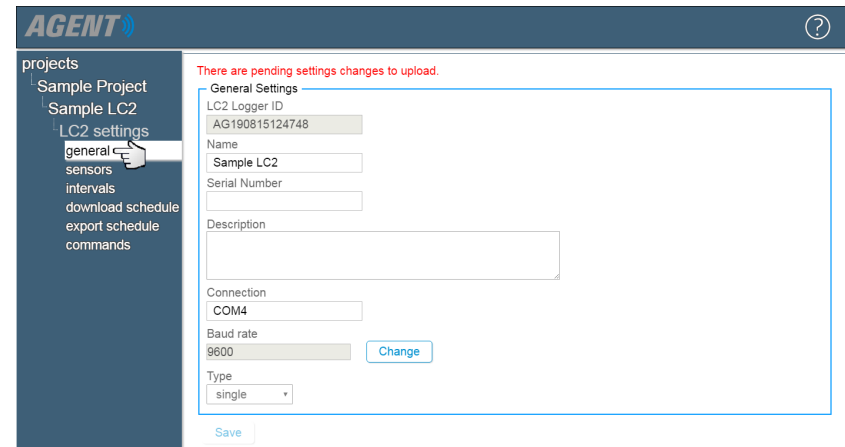


FIGURE 101: General LC2 Settings

Table 23 describes the available **General** settings.

Label	Description
LC2 Logger ID	Static field displaying the Logger ID assigned to the LC2 by Agent. The Logger ID is used by the Agent program to differentiate LC2 dataloggers.
Serial Number	Enter the serial number of the LC2. This is not required, but it is recommended to help the user differentiate LC2 dataloggers.
Connection	The method of connection used for the LC2. Enter a COM port, URL, or IP address with port number. See Section 3.1.
Baud rate	LC2 dataloggers can communicate at baud rates of 9600 and 115,200. To change the current setting select Change . A baud rate of 9600 is required for single channel LC2 dataloggers with firmware prior to version 5.2.X and for multichannel LC2 dataloggers with firmware prior to version 3.1.X.

Label	Description
Type	Static field displaying the type of LC2 (how many channels it has).
	Appears when changes have been saved in the Sensors screen (<i>Section 4.4.2</i>) or Intervals screen (<i>Section 4.4.3</i>) but have not yet been uploaded to the LC2. See <i>Section 4.4.6</i> for information on uploading.

TABLE 23: General Settings Label Descriptions

4.4.2 SENSORS

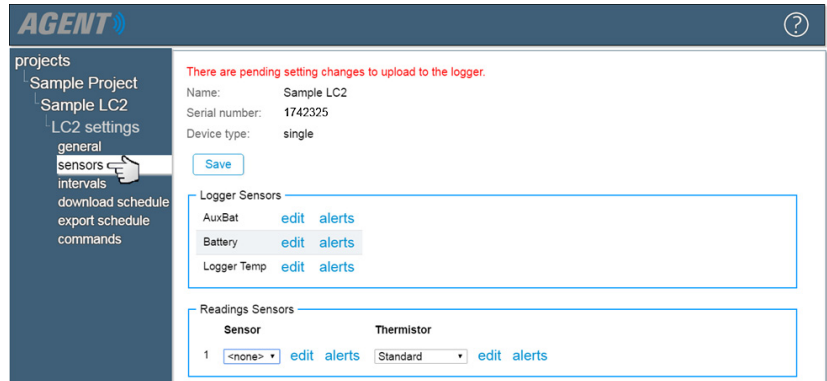


FIGURE 102: Sensor Settings

Sensors collect data; this data is then displayed as a line on a chart. For more information on Charts, see *Section 5*. The Sensors Settings screen allows the user to edit the sensors associated with an LC2 as well as create alerts that are displayed on a chart when data criteria set by the user is exceeded. The different sections of the screen are covered in the subsections below.

NOTE: Any changes that are saved on this screen must be uploaded to the LC2 for them to take effect. If changes have been made, but they have not yet been uploaded to the datalogger, the message **There are pending setting changes to upload to the logger** appears at the top of the screen. For information on uploading settings to the LC2 see *Section 4.4.6*.

4.4.2.1 NAME / SERIAL NUMBER / DEVICE TYPE

NAME / SERIAL NUMBER: Static fields showing the name and serial number of the LC2. To change the name or serial number, select **general** on the left side of the screen to go to the general LC2 settings.

DEVICE TYPE: Static field displaying the type of LC2 (how many channels it has.)

4.4.2.2 LOGGER SENSORS

The Logger Sensors portion of the screen (Figure 103) shows the factory installed sensors contained within the LC2.

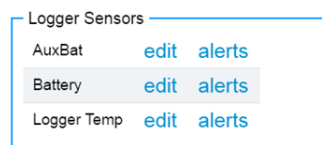


FIGURE 103: LC2 Sensors

Alerts can be used to create alerts that display on the View Charts and Live Charts screens when user defined criteria are exceeded. For information on alerts, see *Section 6*.

To edit an LC2 sensor, select **edit**. This opens the Edit Sensor dialog for that sensor (Figure 104). For information on the available settings, see Table 24 below.

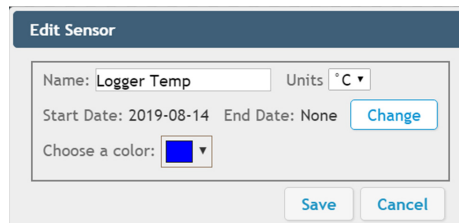


FIGURE 104: Edit LC2 Sensor Dialog

Label	Description
Start/End Date	See Table 10 on page 20
Choose a Color	See Table 10 on page 20.

TABLE 24: Descriptions of the Edit LC2 Sensor Dialog

4.4.2.3 READING SENSORS

The **Readings Sensors** portion of the screen (Figure 105) shows the external sensors attached to the LC2 by the user (piezometers, strain gauges, etc.) Each row represents a channel on the LC2. If it is a four-channel LC2, there are four rows displayed with the numbers one through four representing the corresponding channel on the LC2.

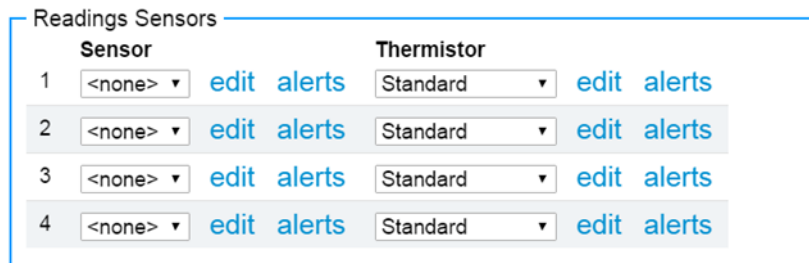


FIGURE 105: Reading Sensors

Use the drop-down box in the **Sensor** column to select the model series of the gauge attached to that channel of the LC2. Use the drop-down box under **Thermistor** to select the type of thermistor installed in the gauge.

To edit a Sensor or Thermistor, select **edit**. See Figure 106 and Figure 107 and the accompanying tables for information on editing Sensors and Thermistors.

The **Alerts** column can be used to create alerts that display on the View Charts and Live Charts screens when user defined criteria are exceeded. For information on alerts, see *Section 6*.

Edit Sensor

Sensor

Name: Reading_1 Serial Number: [Get Calibration](#)

Type: Reading 1 Category: Default Calibration Units: - Output Units: Digits

Multiplier: 1 Offset: 0

Description/Notes:

Start Date: 2016-08-25 End Date: None [Change](#)

Choose a color:

Calculations (Digits)

Calculation: $[G * (R_1 - R_0) + K * (T_1 - T_0)] * \text{Multiplier} + \text{Offset}$
Output = $[1 * (R_1 - 0)] * 1 + 0$

Linear Gage Factor(G): 1 Zero Reading(R0): 0


Polynomial Factors A: 0 B: 1 C: 0 [Calculate C](#)

Temperature Correction

Thermal Factor(K): 0 Zero Temperature(T0): 0

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

FIGURE 106: Edit Sensor Dialog

Label	Description
Serial Number	The serial number of the gauge connected to the LC2. This is not required, but it is recommended to help the user differentiate gauges.
	Retrieves calibration data, if available, from GEOKON's database and populates the Linear Gauge Factor (G) , as well as the Polynomial Gauge Factors A, B, and C .
Type	Static field showing which channel of the LC2 the sensor is associated with. For example, if the Type is Reading 2 , then the sensor being edited is on channel two of the LC2.
Category	Choose the category that coincides with the type of gauge connected. Refer to the manual that was supplied with the gauge if unsure.
Calibration Units	Available Calibration Units vary based on what category has been chosen. The selected units should match the units of the gauge factor on the calibration report provided with the gauge.
Output Units	Determines the type of engineering units the data is displayed in.
Multiplier	Applied to the linear or polynomial calculation. It can be used to convert units. If the selected output units differ from the calibration units , Agent automatically calculates the multiplier to convert the units.
Offset	Offset is an optional constant that can be added to the sensor output to adjust the data. For example: If a piezometer installed at a site elevation of -40 feet is reading +2 feet of water, entering an offset of -40 would adjust the reading to -38 feet, the actual water elevation of the sensor.
Start/End Date	See Table 10 on page 20.
Choose a Color	See Table 10 on page 20.
Calculation:	Shows the equation that is used to calculate the sensor output.
Output =	The output equation is the calculation applied to the data. The output equation changes automatically to reflect the information entered in the dialog.
Linear	Select to utilize the linear calibration equation.
Gage Factor (G)	The default gauge factor of one can be used to output the data in digits. To output the data in other engineering units, the gauge factors found on the GEOKON Calibration Report provided with the vibrating wire sensor must be entered.


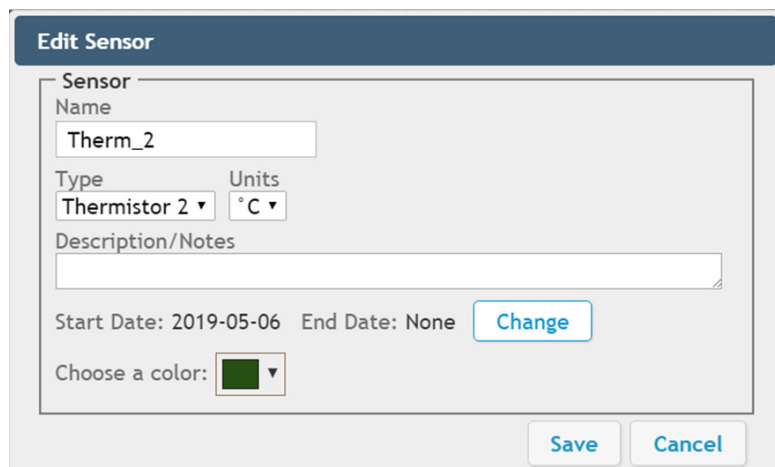
Label	Description
Zero Reading (R_0)	Enter the initial onsite zero reading. It is <i>highly recommended</i> that an accurate initial zero reading be obtained for each sensor, as this reading is used for all subsequent data reduction. However, the factory zero reading on the calibration report may be sufficient if no onsite zero reading exists. Consult the sensor manual for more information.
Polynomial	Select to utilize the polynomial calibration equation.
Factor A	Required for output in engineering units. Found on the GEOKON Calibration Report provided with the gauge.
Factor B	Required for output in engineering units. Found on the GEOKON Calibration Report provided with the gauge.
Factor C	Value is displayed after selecting Calculate C .
	Calculates the value of Factor C from a user entered zero reading.
Temperature Correction	If maximum accuracy is desired, or if ambient temperature changes are large, a temperature correction can be applied. Checking this box includes the values entered in the Thermal Factor and Zero Temperature fields in the output equation.
Thermal Factor (K)	Enter the Thermal Factor from the calibration report.
Zero Temperature (T_0)	If using an onsite zero reading, enter the temperature at which the onsite zero reading was taken in degrees Celsius. If using the factory zero reading, enter the temperature listed on the bottom of the GEOKON Calibration Report.

TABLE 25: Descriptions for the Edit Sensor Dialog



The screenshot shows the 'Edit Sensor' dialog box. It contains the following fields and controls:

- Name:** Text input field containing 'Therm_2'.
- Type:** Dropdown menu set to 'Thermistor 2'.
- Units:** Dropdown menu set to '°C'.
- Description/Notes:** Text area for additional information.
- Start Date:** 2019-05-06
- End Date:** None
- Change:** Button to update the sensor information.
- Choose a color:** Color selection dropdown currently showing green.
- Save:** Button to save the changes.
- Cancel:** Button to cancel the changes.

FIGURE 107: Edit Sensor Dialog for Thermistors

Label	Description
Type	Static field showing which channel of the LC2 the thermistor is associated with. For example, in Figure 107 the Type shows Thermistor 2 meaning that the thermistor being edited is on channel two of the LC2.
Start/End Date	See Table 10 on page 20
Choose a Color	See Table 10 on page 20.

TABLE 26: Descriptions for the Edit Thermistor Dialog

4.4.3 INTERVALS

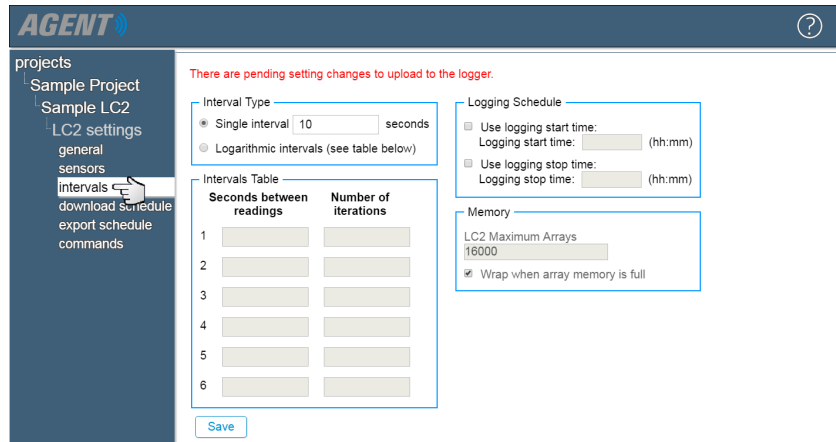


FIGURE 108: Intervals Settings

The Intervals Screen (Section 108) is used to define the interval between readings taken by the LC2 datalogger. The different sections of the screen are covered in the subsections below.

NOTE: Any changes that are saved on this screen must be uploaded to the LC2 for them to take effect. If changes have been made, but they have not yet been uploaded to the datalogger, the message **There are pending setting changes to upload to the logger** appears at the top of the screen. For information on uploading settings to the LC2 see *Section 4.4.6*.

4.4.3.1 INTERVAL TYPE AND INTERVALS TABLE

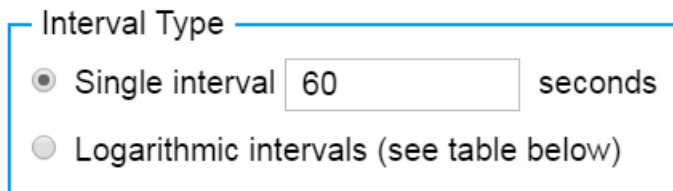


FIGURE 109: Single Interval

Determines whether a single or logarithmic interval is used to schedule readings.

When using **Single interval**, enter the desired interval between readings in seconds. If the value of **seconds** divides evenly into a time, then readings are synchronized to real-time. For example, entering an interval of 3600 seconds causes the readings to occur on the hour, every hour. This is not true when a

start time has been set in the **Logging Schedule**. See *Section 4.4.3.2* below for more information.)

When using **Logarithmic intervals**, the Intervals table (Figure 110) is used to schedule readings. Interval lengths are specified in seconds. The maximum interval length is 86,400 seconds or one set of readings per day. The minimum interval length is three seconds. An entry of zero is not allowed. Up to six intervals can be entered. **Logarithmic intervals** do not synchronize to real-time the same way that **Single interval** does.

	Seconds between readings	Number of iterations
1	60	100
2	3600	10
3	14400	1
4		
5		
6		

FIGURE 110: *Logarithmic Intervals*

Number of Iterations is the number of times each interval is repeated. The maximum number of iterations is 255. Entering zero for any iteration causes the datalogger to repeat that interval until logging is disabled. Normally an entry of zero is only used for the last interval. If the number of iterations for the last interval value is greater than zero, the datalogger logs data for the specified number of iterations and then stop logging.

4.4.3.2 LOGGING SCHEDULE

<input checked="" type="checkbox"/>	Use logging start time:	Logging start time: 01:30 (hh:mm)
<input checked="" type="checkbox"/>	Use logging stop time:	Logging stop time: 15:30 (hh:mm)

FIGURE 111: *Logging Schedule*

The logging schedule can be used to define a specific start and/or stop time for readings to take place. This feature can be used to synchronizing the reading intervals of multiple LC2 dataloggers.

To enable the Start or Stop Time, check the corresponding box, then enter the desired time. Times must be entered in 24-hour format. For example, 3:30 PM becomes 15:30.

4.4.3.3 MEMORY

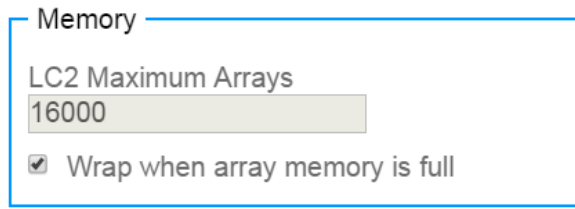


FIGURE 112: Memory

The static field **LC2 Maximum Arrays** displays the maximum number of data arrays the LC2 is capable of storing. Table 27 shows the maximum arrays for each type of LC2.

LC2 Type	Maximum Number of Arrays
Single Channel	16,000
4-Channel	10,666
16-Channel	5,555

TABLE 27: Maximum Data Arrays Stored

Checking the box next to **Wrap when array memory is full** causes the LC2 to overwrite the oldest data when the memory is full (the maximum number of arrays have been saved). If the box is not checked, the LC2 halts logging when the maximum number of arrays is reached.

4.4.4 DOWNLOAD SCHEDULE

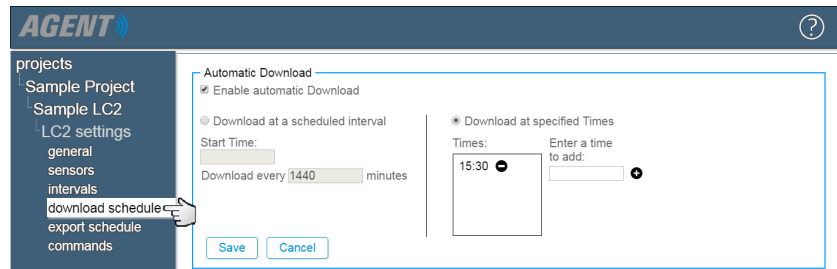


FIGURE 113: Schedule Settings

Data is only be collected from the LC2 when a data download occurs. Data does not appear on charts or other screens until it has been downloaded from the LC2. Table 28 describes the available Automatic Download settings.

Label	Description
Enable Automatic Download	Optional field for user input of any additional information.
Download at a Scheduled Interval	Select this option to have the automatic download recur in intervals. The frequency of the download is based on the integer entered in the Download data every ___ minutes field. The first download occurs at the specified Start time . Start time must be entered in the 24 hour format. For example: 3:30 PM becomes 15:30.)

Label	Description
Download at Specific Times	Select this option to have data automatically downloaded at specific times of the day. Enter a time in 24-hour format and then select the + icon. The time entered is added to the list of download Times . To remove a download time from the list, select the corresponding - icon.

TABLE 28: Automatic Download Settings

4.4.5 EXPORT SCHEDULE

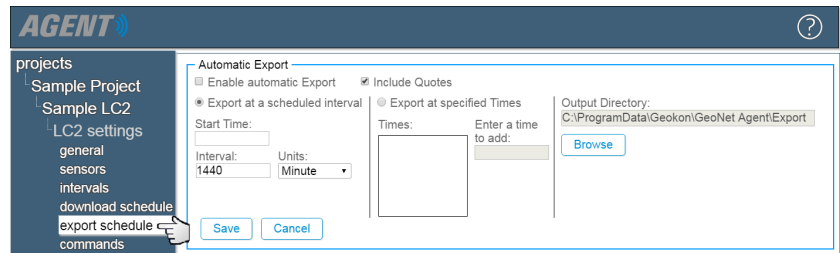


FIGURE 114: Automatic Export

The **Export Schedule** feature of Agent is designed to work with data management programs like Vista Data Vision®. The file type and other export settings can be changed using the Export screen. See *Section 4.6* for more information.

Data is exported to the same file each time an export occurs. A new file is only created after adding or removing an LC2, chart, sensor, or changing the sensor mapping. In these cases, in order to maintain the historical structure of the data, the previous file is given the extension ***.bad** and a new file is created.

Table 28 describes the available Export Schedule settings.

Label	Description
Enable Automatic Export	Check or uncheck this box to enable/disable automatic export.
Include Quotes	Contains everything between the delimiters with quotes. Regions that use alternate date formats or commas as decimal points may require this for import of the file into other programs. Note: Checking or unchecking this box causes the same action to occur on the Quote the fields check box in the Export screen. See <i>Section 4.6</i> for information on the Export screen.
Export at a Scheduled Interval	Select this option to have data exported at regular intervals. The first export occurs at the specified Start time . Enter the desired start time in 24-hour format. For example, 3:30 PM becomes 15:30. Data download recurs based on the information entered in the Interval and Units fields.

Label	Description
Export at Specified Times	Select this option to set specific times of the day for the data to be exported. Enter a time in 24-hour format (for example 3:30 PM becomes 15:30) in the Enter a time to add field and then select the + icon to add it to the list of download Times . To remove a download time from the list, select the - icon next to the time to be removed.
Output Directory	Determines how the file is saved. To set the Output Directory, select browse . Note: The location chosen as the output directory is also set as the Export Folder in the Export screen. Section 4.6 covers the Export screen.
Save	Saves the current settings to the network
Cancel	Returns the Automatic Export settings to their previously saved configurations.

TABLE 29: Automatic Download Settings

4.4.6 COMMANDS

The Commands screen (Figure 115) is used to communicate with the LC2. There must be an active connection between the LC2 and the PC for the Upload screen to function properly. The different sections of the screen are covered in the subsections below.

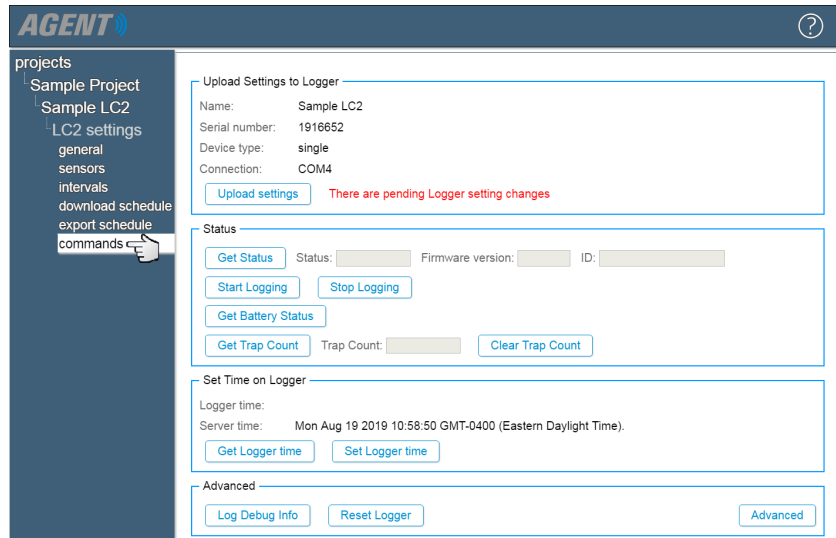


FIGURE 115: Commands Screen

4.4.6.1 UPLOAD SETTINGS TO LOGGER

Refer to Figure 115 and Table 30 for information on the **Upload Settings to logger** portion of the screen.

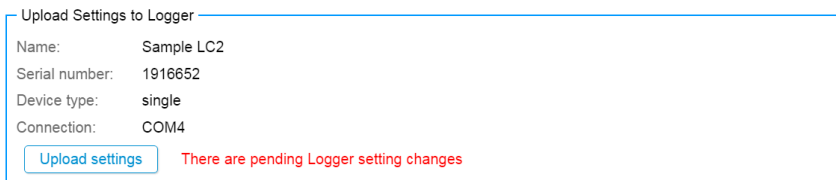


FIGURE 116: Upload Settings to the LC2


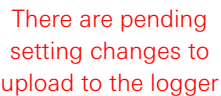
Label	Description
Device Type	Static field displaying the type of LC2 (how many channels it has).
Connection	The method of connection used for the LC2. Enter a COM port, URL, or IP address with port number. See <i>Section 4.1</i> .
	The Upload settings button sends all settings that affect the LC2 to the datalogger.
	This message appears when changes have been saved in the Sensors screen (<i>Section 4.4.2</i>) or Intervals screen (<i>Section 4.4.3</i>) but have not yet been uploaded to the LC2.

TABLE 30: Descriptions for Upload Settings to Logger

4.4.6.2 STATUS

Refer to Figure 117 and Table 31 for information on the **Status** portion of the screen.

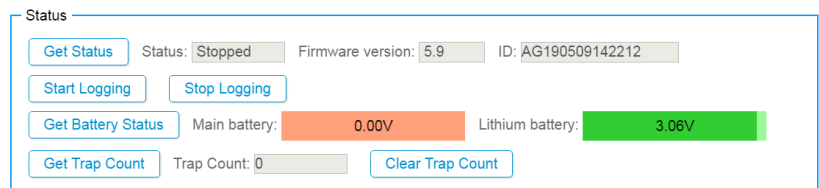






FIGURE 117: Status

Label	Description
	Retrieve and display the current logging status, firmware version, and ID.
	Select to have the LC2 begin logging data. The Status field changes to Logging .
	Select to have the LC2 stop logging data. The Status field changes to Stopped .
	Select to display the current voltage level of the Main battery and the Lithium battery . The Main battery (two 1.5 V D cells) provides the power required to operate the LC-2 datalogger. The Lithium battery (3 V lithium coin cell) maintains the correct date and time settings when the D cells are removed. Batteries should be replaced when the measured voltage drops below 1.8 VDC (internal 3 V battery) or 10.5 V (external 12 V battery).

Label	Description
Get Trap Count	Select to display the Trap Count . The trap counter is a register that keeps track of the number of times that the internal processor has detected a communications error. This register is used to determine if communication problems are occurring.
Clear Trap Count	Reset the trap count register to zero.

TABLE 31: Descriptions for the Status Screen

4.4.6.3 SET TIME ON LOGGER

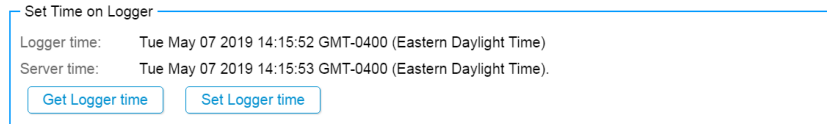


FIGURE 118: Set Time on Logger

Logger time: shows the date and time information stored on the LC2.

Server time: shows the date and time information collected from the PC.

Selecting **Get Logger time** refreshes both the **Logger time:** and the **Server time:**.

Select **Set Logger time** to overwrite the current **Logger time:** with the date and time information from the PC.

4.4.6.4 ADVANCED

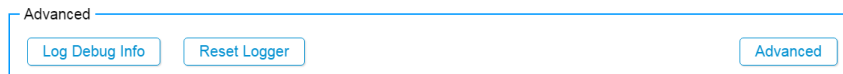


FIGURE 119: Advanced

The advanced section of the Upload screen is normally only used under the direction of GEOKON technical support and should not be needed during day-to-day operation. Contact GEOKON for more information.

4.5 DOWNLOAD

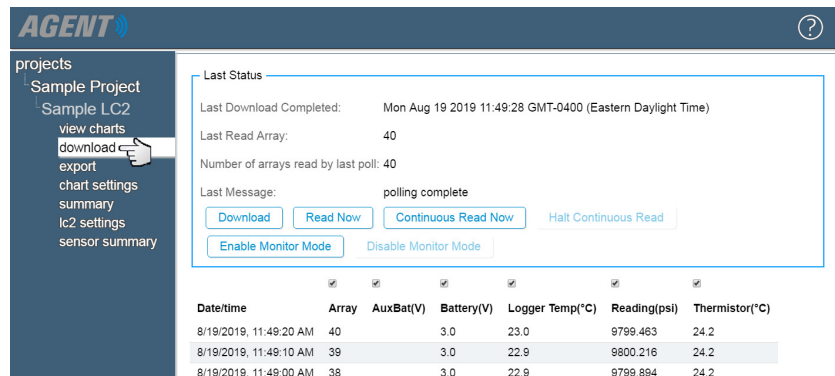


FIGURE 120: Download Screen

Last Download Completed, Last Read Array, Number of arrays read by last poll, and **Last Message** are static fields that display information about the previous download.

When **Download** is selected, Agent connects to the LC2 and begin downloading any new data that was collected by the datalogger since the previous download occurred. Figure 121 shows a download in progress.

Date/time	Array	AuxBat(V)	Battery(V)	Logger Temp(°C)	Reading(psi)	Thermistor(°C)
8/19/2019, 12:19:20 PM	220		3.0	22.9	9804.145	22.0
8/19/2019, 12:19:10 PM	219		3.0	22.9	9804.252	22.0

FIGURE 121: Download in Progress

Last Status Update displays the date and time when the download began. While downloading, Agent displays the number of data arrays that have been read and the number of arrays remaining. The download can be halted by selecting **Cancel Download**.

Data collected from the LC2 is displayed in the table on the bottom half of the screen. The check boxes above each data column are used to show or hide the data in that column. If no data is available for download, make sure the logging intervals are set correctly (Figure 4.4.3) and that the **Start Logging** button has been pressed (Figure 4.4.6).

Select **Read Now** to have the LC2 to take an immediate **test** reading (Figure 122). Test readings are not saved to the LC2 or the Agent database.

Date/time	Array	AuxBat(V)	Battery(V)	Logger Temp(°C)	Reading(Digits)	Thermistor(°C)
Test 11:03:26 AM			2.9	23.3	9012.303	21.4
9/9/2019, 11:02:00 AM	4		2.9	23.1	9012.351	21.4
9/9/2019, 11:01:00 AM	3		2.9	23.2	9012.351	21.4

FIGURE 122: Test Reading Data

Selecting **Continuous Read Now** causes Agent to take a test reading every few seconds until **Halt Continuous Read** is selected.

Select **Enable Monitor Mode** to have Agent display sensor readings taken by the LC2 as they occur (Figure 123). If no data is displayed, ensure the logging intervals are set correctly (Section 4.4.3) and the **Start Logging** button has been pressed (Section 4.4.6).

Monitor readings continue to be displayed until **Disable Monitor Mode** is selected.

NOTE: Readings that are displayed using **Monitoring Mode** are not saved to the Agent database until they are downloaded from the LC2 using the **Download** button.

Last Status

Last Download Completed: Mon Aug 19 2019 12:44:38 GMT-0400 (Eastern Daylight Time)

Last Read Array: 371

Number of arrays read by last poll: 331

Last Message: polling complete

	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Date/time	Array	AuxBat(V)	Battery(V)	Logger Temp(°C)	Reading(psi)	Thermistor(°C)
Monitor 12:48:50 PM			3.0	23.1	9806.604	21.6
Monitor 12:48:40 PM			3.0	23.2	9806.049	21.6
Monitor 12:48:30 PM			3.0	23.2	9806.063	21.6
Monitor 12:48:20 PM			3.0	23.2	9806.261	21.6

FIGURE 123: Monitoring Mode Enabled

4.6 EXPORT

The Export screen is used to configure the export settings and can also be used to perform a manual export of the data. The settings made in the Export screen are also applied to files automatically exported by the **Export Schedule**. See *Section 4.4.5* for information on setting up an export schedule.

Exporting data can facilitate further data processing by allowing the data to be imported into a third-party tool, such as a spreadsheet program, word processor, or data visualization software. To go to the Export screen, select the Project that contains the LC2 and then select the name of the device to be exported.

The screenshot shows the AGENT web interface. On the left is a sidebar with a 'projects' menu containing 'Sample Project', 'list', 'add network', 'add lc2', 'transfer', and 'project settings'. The main content area is divided into two sections: 'GeoNet Networks' and 'LC2 Data Loggers'. The 'GeoNet Networks' section has a table with columns: name, settings, download, gateway serial number, address, scan rate, download rate, and delete. It contains one entry: 'Sample Network'. The 'LC2 Data Loggers' section has a table with columns: name, settings, download, serial number, address, scan rate, type, and delete. It contains three entries: 'Sample LC2', '4-Channel LC2', and '16-Channel LC2'. A mouse cursor is pointing at the 'Sample LC2' entry.

FIGURE 124: Select an LC2

Agent goes to the View Charts screen. See *Section 5* for information on working with charts. Next select **export** (Figure 125)

The screenshot shows the AGENT web interface with the 'export' option selected in the sidebar. The main content area is titled 'General' and contains the following settings:

- Export folder: C:\ProgramData\Geokon\GeoNet Agent\Export (with a 'Browse' button)
- File format: CSV (dropdown menu)
- Date format: Year, Month, Day (dropdown menu)
- Time format: HH,MM (dropdown menu)
- Field separator: Comma (dropdown menu)
- Add meta-data to export file
- Add column headers to export file
- Quote the fields

 At the bottom are 'Save' and 'Export' buttons.

FIGURE 125: Export Data

For more information about the Export screen, refer to Table 32.

Label	Description
Export Folder	<p>Determines when the data file is saved. To set the export folder, select browse.</p> <p>Note: The location chosen as the export folder is also set as the Output Directory in the Export Schedule screen. See <i>Section 4.4.5</i> for information on the Export Schedule screen.</p>
File Format	<p>Choose CSV, DAT, TXT or VDV:</p> <p>CSV - Data files are exported in Comma Separated Value (CSV) format, which is easily imported into Microsoft Excel or another spreadsheet program.</p> <p>DAT - Data files are exported as a Generic Data File (.dat). This file type is commonly used by data visualization software.</p> <p>TXT - Data files are exported in a standard text data format *.txt, which can be opened and edited using a wide variety of text editing and word processing programs.</p> <p>VDV - Data files are exported in a format that is easily imported into Vista Data Vision software. This file is used by Vista Data Vision software to provide column names for the exported data. When VDV is selected for File Format, all options below file format are disabled except Field Separator. The exported data is formatted and saved as a *.dat file in the export folder.</p>
Date Format	<p>Determines how the date stamp on the data arrays are displayed in the exported file. Choose from:</p> <p>Year/Month/Day, Year, Day of year or Serial date. When Serial date format is chosen, all date and time columns, except the year (yyyy), are replaced with a decimal number representing the number of days since 1/1/1900. The number contains a fractional (time) part, which represents a percentage of 24 hours. For instance, the number 40532.75393518519 represents the date: 12/20/2010 and the time: 18:05.</p>
Time Format	<p>Choose whether to have a comma inserted between the hour and minute on the time stamp of the data arrays.</p>
Field Separator	<p>Determines how fields are separated within the data file. Choices include: Comma (,), Semicolon (;) and Tab (ASCII 09)</p>
Add Meta-Data to Export File	<p>Select this option to add Agent meta data is to the top of the export file. This data consists of workspace name, Project name, read interval, collection date, and number of sensors.</p>

Label	Description
Add Column Headers to Export File	Select this option to add a header to the top of each column that describes what data the column contains, (logger name, array, sensor name, etc.)
Quote the Fields	When this option is selected, each field is wrapped with double quotes. This may be necessary if any of the fields contain the selected separator character. Note: Checking or unchecking this box causes the same action to occur on the Include Quotes check box in the Export Schedule screen. See <i>Section 4.4.5</i> for information on the Export Schedule screen.

TABLE 32: Descriptions for the Export Screen

5. CHARTS

Charts display data imported by sensors as a graph. Sensors must be added to a chart before it will display any data.

If automatic download is enabled, new data is added to charts automatically each time data is downloaded from the network. If automatic download is disabled, charts will not update until a manual download is performed.

5.1 CREATE CHARTS

Go to the GeoNet Logger, Gateway, or LC2 datalogger the chart was created for and then select **chart settings** (Figure 126).

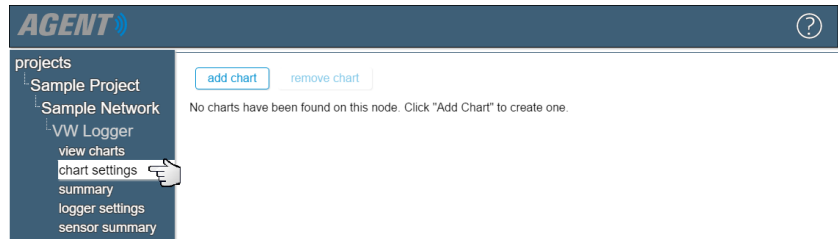


FIGURE 126: Chart Settings

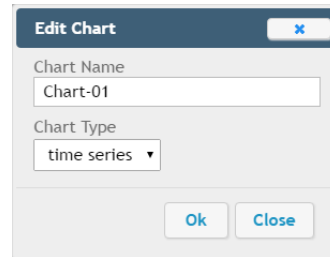


FIGURE 127: Edit Chart Dialog

Enter a chart name and then select **Ok**. The new chart is listed on the Chart Settings screen (Figure 127).

The only available **Chart Type** is **time series** except when creating a chart for a device that has a Tilt Deflection Sensor (*Section 3.7.5.2*) associated with it. When creating a chart for these devices, an additional chart type of **Deflection** is available. See *Section 5.3.2* for more information on MEMS deflection charts.

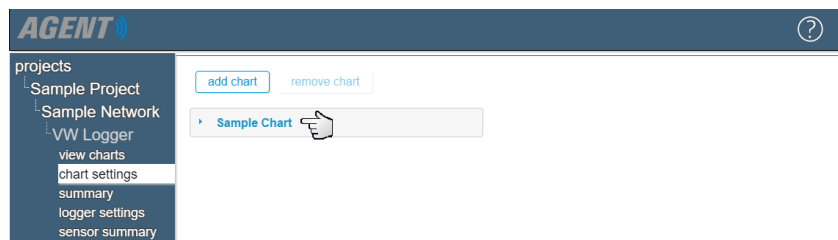


FIGURE 128: List of Charts

The chart name and type can be changed at any time by selecting the chart name and then selecting **edit** (Figure 129).

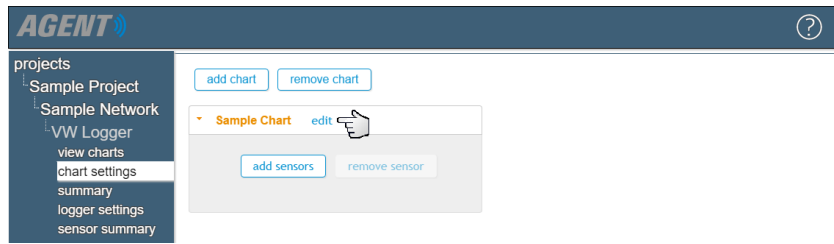


FIGURE 129: Edit Chart

To remove a chart, select the name of the chart to delete and then select **remove chart**.

5.2 ADD SENSORS TO CHARTS

A chart displays data collected by sensors; therefore, a chart will not display any data until at least one sensor is added to it. To add a sensor to a chart, select the desired chart from the list and then select **add sensor** (Figure 130).

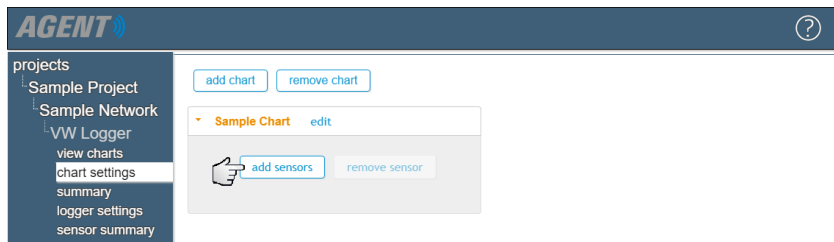


FIGURE 130: Add Sensor

This will open the **Add Multiple Sensors to Chart** dialog (Figure 131).

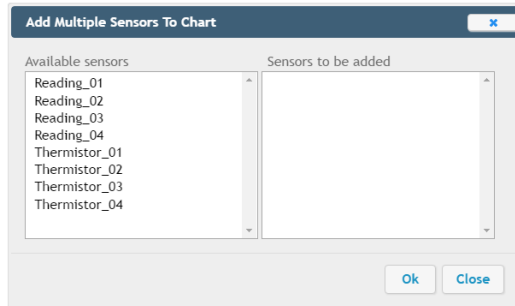


FIGURE 131: Add Multiple Sensors to Chart

Select on the desired sensors in the list of **Available Sensors** to add them to the list of **Sensors to be added**. For LC2 dataloggers, all the logger’s sensors are available. For GeoNet devices, only sensors that were previously added to the device are available. For information on adding sensors to GeoNet devices, see *Section 3.7*.

select **Ok** to add all the sensors in the **Sensors to be added** list to the chart.

Sensors that were added to the chart are listed beneath the chart name (Figure 132).

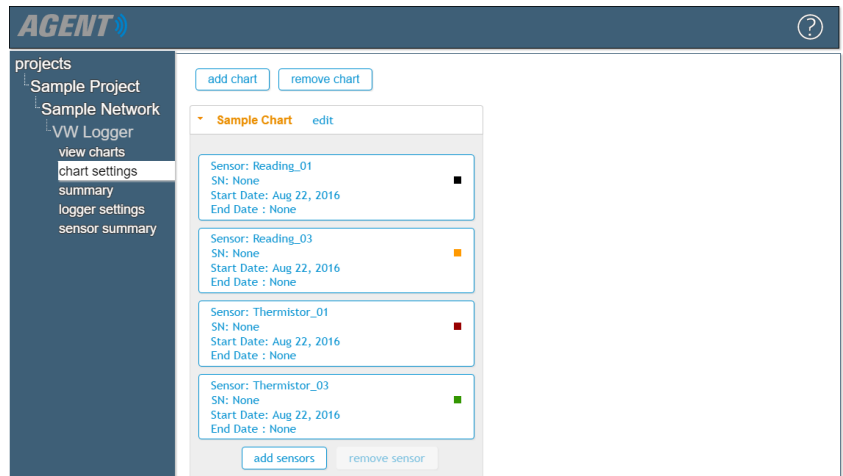


FIGURE 132: Sensors Associated with a Chart

To remove a sensor from a chart, select the sensor to delete and then select [remove sensor](#).

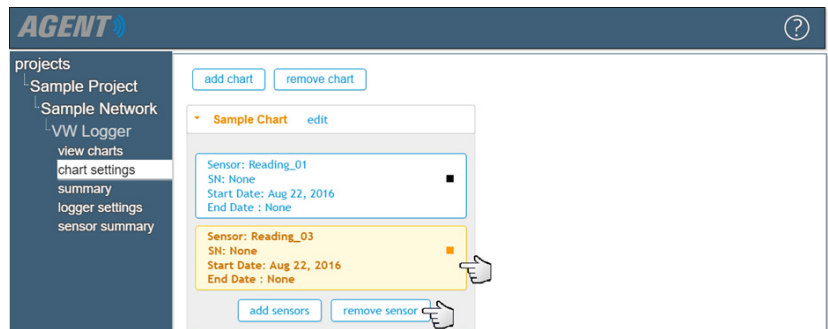


FIGURE 133: Remove Sensor from Chart

5.3 VIEW CHARTS

To view the charts associated with a device, go to the desired GeoNet Logger, Gateway, or LC2 datalogger and then select [view charts](#). The charts displayed in the View Charts screen will update only when new data is downloaded from a device.

5.3.1 TIME SERIES CHARTS

Charts are displayed as a line graph, with time comprising the X-axis and sensor data comprising the Y-axis. Refer to Figure 134 and Table 33 for more information.



FIGURE 134: View Chart Screen


Arrow Number	Description
1	Unchecking the box next to Show tooltips on charts will disable the popup details shown by arrow two.
2	The date, time, and reading of any data point can be viewed by hovering the cursor over it.
3	Select the  icon to save the chart as one of the following file types: PNG, JPEG, PDF, or SVG.
4	Select on the name of a sensor to show or hide the corresponding graph. In (Figure 134) the graph line for the Battery sensor was hidden.
5	These sliders can be used to zoom in on a particular area of the graph.
6	Displays the start/stop time of the data being graphed. The time can be changed by moving the sliders highlighted by arrow seven.
7	These sliders determine the range of data displayed. If there is no data to display at the specified start date, the chart will start with the nearest previous data set.

TABLE 33: Descriptions for the View Charts Screen

When there are multiple charts associated with a single device, the charts are displayed in the order they listed on the Chart Settings Screen. To change the order, select **chart settings** on the left side of the screen, then select and drag the charts into the desired order (Figure 135).

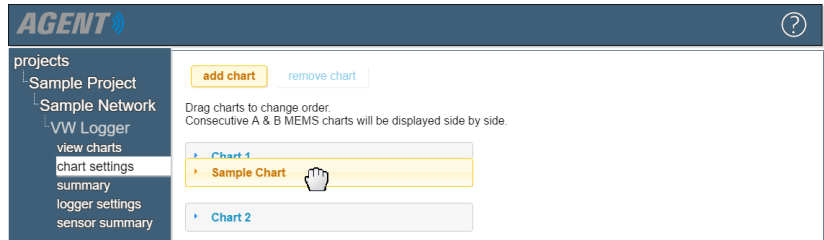


FIGURE 135: Reorder Chart List

5.3.2 TILT SENSOR CHARTS

Displacement and deviation charts can be created to chart the data collected by tilt sensors. available in addition to the time series chart. To add a displacement or deviation chart to a Logger, the Logger’s **Type** must be set to **Tilt Logger** and **Tilt Sensors** must be assigned to the Logger (see *Section 3.7.5*).

To create a deviation or deflection chart, go to the Logger the chart was created for and then select **chart settings** (Figure 136).

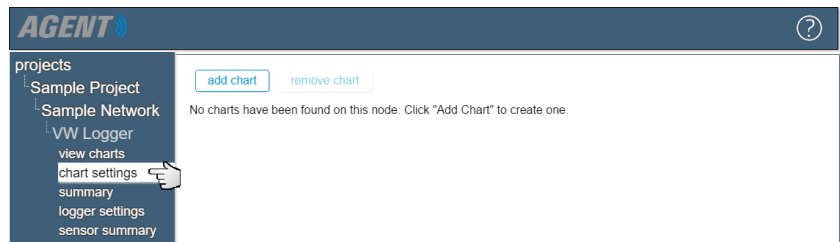


FIGURE 136: Chart Settings

Select **add chart** to open the **Edit Chart** dialog. Select the type of chart you wish to add (Figure 137), then choose whether it will display the A or B axis of the sensors. Click **Ok** to create the chart.

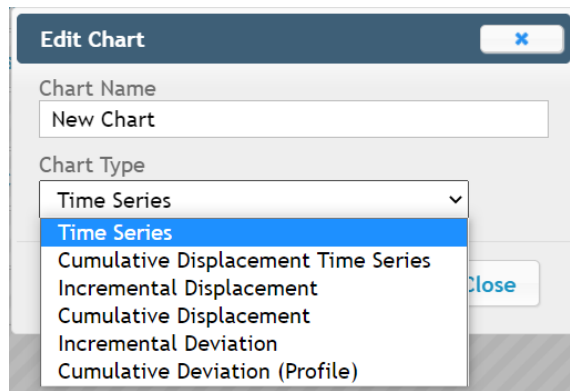


FIGURE 137: Select Chart Type

When a chart is created, it is listed on the Chart Settings screen. To view the created chart, select **view charts** on the left side of the screen (Figure 138).

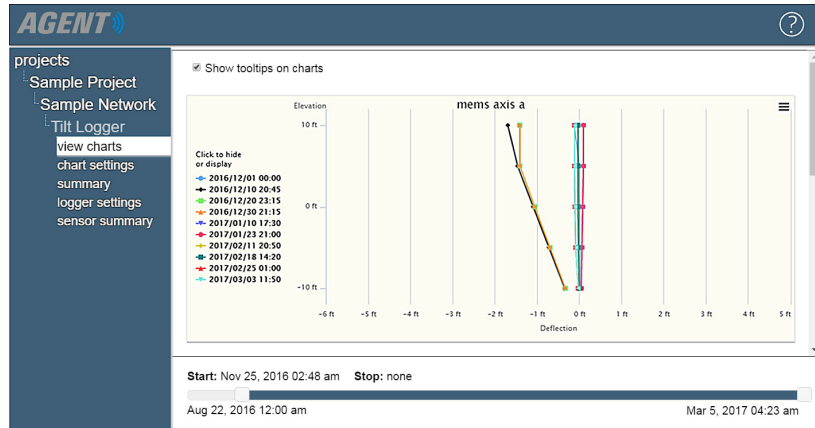


FIGURE 138: Tilt Sensor Chart

5.4 LIVE CHARTS

Live charts are only available for GeoNet devices. The Live Charts Screen works similarly to the View Charts screen; the main difference being that Live Charts shows the previous six hours of data for all the charts associated with a Network. Live Charts will update at regular intervals according to the automatic download time assigned in Network Settings. If automatic download is disabled, the charts are static. For information on Network Settings, see *Section 3.4*.

To open the Live Charts Screen for a GeoNet Network, select the Project that contains the Network and then select **live** on the left side of the screen (Figure 139).

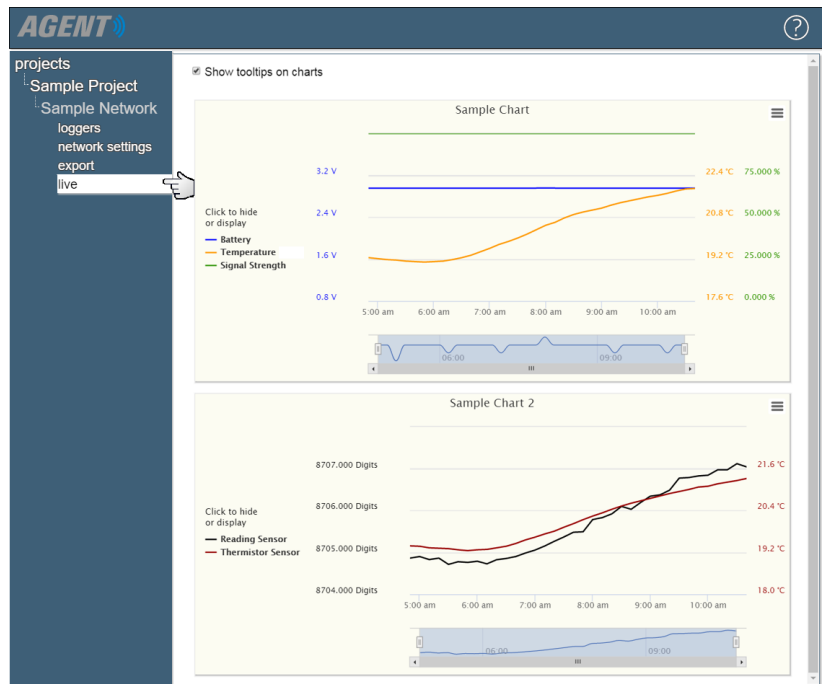


FIGURE 139: Live Charts

The Live Charts screen has the same controls as the View Charts screen, with the exception that there are no start and stop sliders for the date since only the previous six hours of data is displayed.

5.5 CHART SUMMARY

The Chart Summary Screen controls which charts are displayed on the View Charts and Live Charts screens. It is also used to create templates which allow the user to copy chart settings from one device to another. Chart settings can only be copied between devices of the same **Type** (VW Logger to VW Logger, 4-channel LC2 to 4-channel LC2, etc.)

To view the chart summary for a device, go to the desired Logger, Gateway, or LC2 and then select **summary** on the left side of the screen (Figure 140).

Visible	Chart	Sensor	Serial Number	Mapping
<input checked="" type="checkbox"/>	Chart-01	Reading Thermistor	2015662 0	Reading Thermistor
<input checked="" type="checkbox"/>	Chart-02	Battery Signal Strength	0 0	Battery SignalStrength

FIGURE 140: Chart Summary


Label	Description
	Create a template to copy chart settings from one device to another (Device type must match.)
Apply Template	Apply a template created from another device to the one currently selected. Only templates created for matching device types are available.
Column Heading	Description
Visible	Check or uncheck the boxes in this column to show or hide the corresponding chart in the View Charts and Live Charts screens.
Chart	Displays the chart name.
Sensor	Displays the names of sensors that were added to the chart.
Mapping	Displays the sensor type.

TABLE 34: Descriptions for the Chart Summary Screen

6. ALERTS

Alerts are notifications that appear on the View Charts and Live Charts screens when sensor data exceeds the limits set by the user.

6.1 ADD ALERTS

6.1.1 GEONET DEVICES

To add an alert to a sensor on a GeoNet device, go to the Logger or Gateway the alert was created for, select **node settings** on the left side of the screen, and then select the **Alerts** column that corresponds with the desired sensor (Section 141).

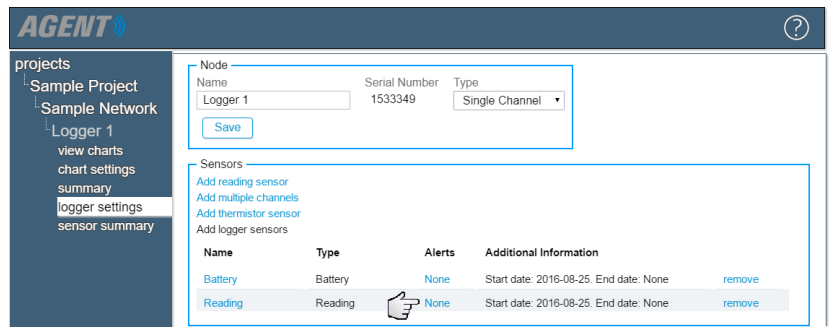


FIGURE 141: Adding an Alert (GeoNet)

For all sensor types except **Tilt Sensors** and **2 Axis Tilt Meter**, selecting a link in the **Alert** column will cause the **Edit Alerts** dialog described in *Section 6.2* to open.

Because MEMS sensors can have separate alerts set for the A-Axis, B-Axis, and Thermistor of each drop, they require the extra step of selecting which axis or thermistor the alert is set for (Figure 142). When an Axis or Thermistor has been selected the **Edit Alerts** dialog described in *Section 6.2* will open.

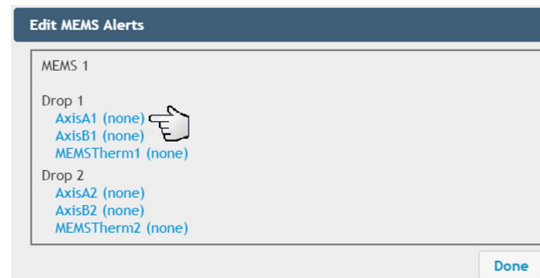



FIGURE 142: MEMS Sensor Alerts

6.1.2 LC2 DATALOGGERS

To add an alert to a sensor on an LC2 datalogger:

Select the Project that contains the LC2, and then select the  icon that corresponds with the LC2 the alert was created for (Figure 143).

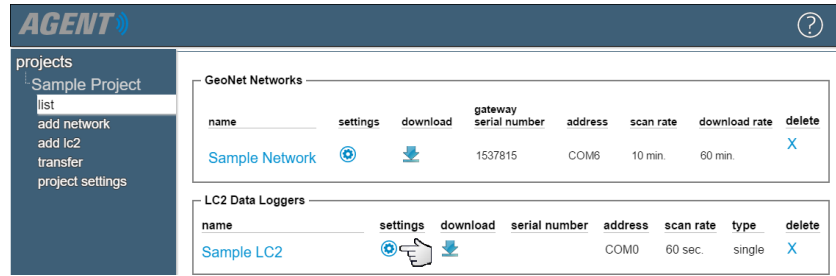


FIGURE 143: Select an LC2 Datalogger

Agent will go to the **General** LC2 Settings. Select **sensors** on the left side of the screen to open the sensor settings. Select the **Alerts** column that corresponds with the desired sensor (Figure 144).

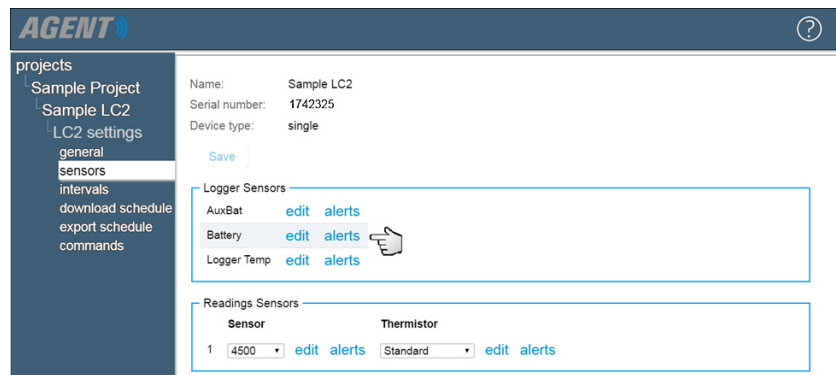


FIGURE 144: Adding an Alert (LC2)

This **Edit Alerts** dialog described in *Section 6.2* opens.

6.2 EDIT ALERTS DIALOG

The **Edit Alerts** Dialog (Figure 146) is used to add, edit, or delete alerts for the selected sensor. Each blue box represents an available alert.

The screenshot shows a dialog titled "Edit Alerts for Logger Temp". It contains four distinct alert configuration sections, each enclosed in a blue border. The sections are: "Max Threshold", "Min Threshold", "Max Slope", and "Min Slope". Each section includes a header, two checkboxes for "Enable" and "Sound Alarm", a numerical input field (all set to "0"), and a text area for a "Message".

FIGURE 145: Edit Alerts Dialog

Refer to Figure 146 and Table 35 for more information on the **Edit Alerts** dialog.

The screenshot shows a dialog titled "Edit Alerts for Battery". It features a single alert configuration section for "Max Threshold" with a blue border. The section includes checkboxes for "Enable" (labeled with a red "2") and "Sound Alarm" (labeled with a red "3"), a numerical input field (set to "0", labeled with a red "4"), and a text area for a "Message" (labeled with a red "5"). At the bottom of the dialog are three buttons: "Save", "Cancel", and "Test Alarm".

FIGURE 146: Edit Alerts Dialog


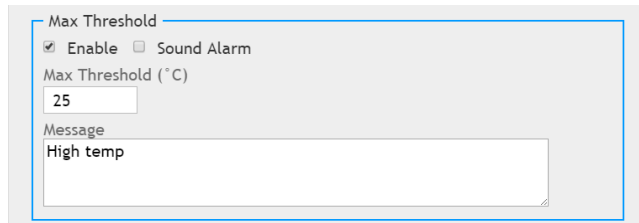
Corresponding # in Figure 146	Description
1	<p>The alert type is shown at the top of each blue box. Alert types are as follows:</p> <p>Max Threshold: Activates when data rises above the set value.</p> <p>Min Threshold: Activates when data falls below the set value.</p> <p>Max Slope: Sets a maximum threshold on the amount the sensor value can change over the period of one minute.</p> <p>Min Slope: Sets a minimum threshold on the amount the sensor value can change over the period of one minute.</p> <p>Old Data: Activates when the time between readings exceeds the set value.</p>
2	<p>Check the Enable box to turn on the alert. When an alerts Enable box is checked, the information that coincides with that alert can be edited.</p>
3	<p>Check the Sound Alarm box to turn on an audible alarm for the alert. The alarm will only sound when a new alert is generated while viewing Live Charts. The alarm sound can be changed by following the instructions in <i>Figure 6.5</i>.</p>
4	<p>An alert becomes active when the data has exceeded the value entered as the Max Threshold or Min Threshold.</p>
5	<p>The text entered in the Message field is displayed in the Alert details. The alert details can be viewed by holding the cursor over the alert triangle (see Figure 149 in <i>Section 6.3</i>).</p>
	<p>Press to hear an example of the audible alarm. To change the alarm sound, follow the instructions in <i>Section 6.5</i>.</p>

TABLE 35: Alert Settings

6.3 ALERT EXAMPLE

Figure 147 is an example of an alert created for a Logger temperature sensor That was set to activate if the reading rises above 25 degrees Celsius. Figure 148 shows the alerts that were subsequently generated in the View Charts Screen.



Max Threshold

Enable Sound Alarm

Max Threshold (°C)

25

Message

High temp

FIGURE 147: Alert Example

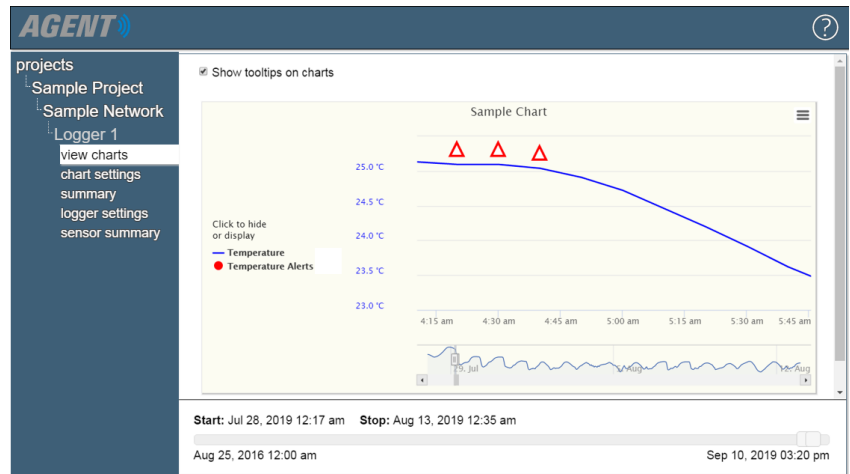


FIGURE 148: Active Alerts

Details about an alert can be seen by hovering the mouse over the alert triangle (Figure 149).

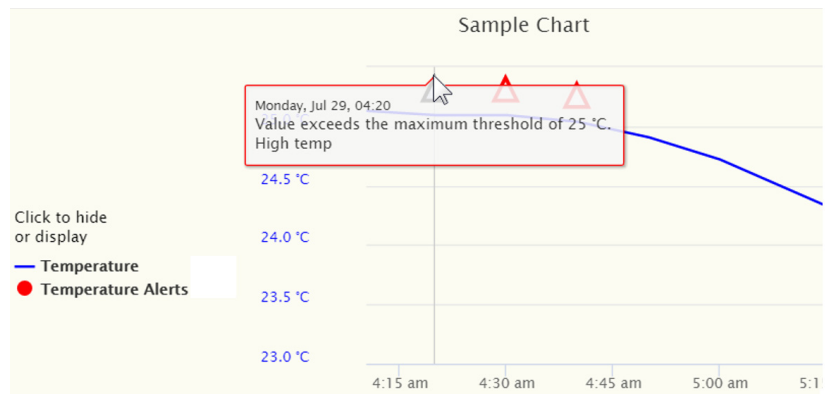



FIGURE 149: Alert Detail

6.4 CLEAR ALERTS IN LIVE CHARTS

To clear all the alerts for a particular chart while in the Live Charts screen, select the  icon located on the bottom left corner of the affected chart (Figure 150). Clearing all current alerts will cause the red alert bar on the left side of the screen to disappear. Exiting Live Charts will cause previously cleared alerts to reactivate.

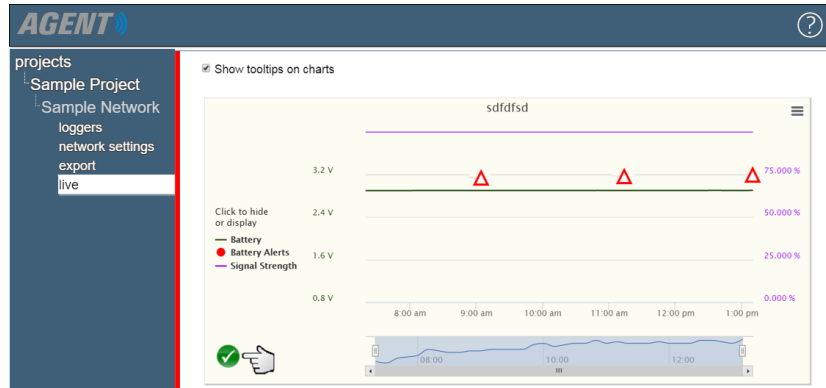


FIGURE 150: Clear Alerts in Live Charts

6.5 CHANGE THE ALARM SOUND

Agent provides a default alarm sound. To change the alarm sound, complete the following:

1. Locate the **GeoNetAlarm.wav** file that was saved to the computer when Agent was downloaded. This file can be found on the drive the program was downloaded to in the following folder: ProgramData\GEOKON\GeoNet Agent\Alarms.
2. Overwrite the current **GeoNetAlarm.wav** file with a *.wav file of the new alert sound. The file name must still be GeoNetAlarm.wav for the alarm to work properly.
3. After the file is installed, return to the Edit Alerts screen in Agent (Section 6.2) and select to verify the new alarm sound is working correctly. If the alarm file cannot be found (it was deleted or misnamed) the default alarm sound is played instead.

7. TRANSFER DATA

Transferring data allows the user to save and subsequently load all of the data for a GeoNet network or LC2 datalogger. Data transfer can facilitate moving data from one computer to another or from one project to another.

To transfer data, go to the Projects screen by selecting **projects** on the left side of the screen. Select the Project the data is transferred from or to, and then select **transfer** (Figure 151).

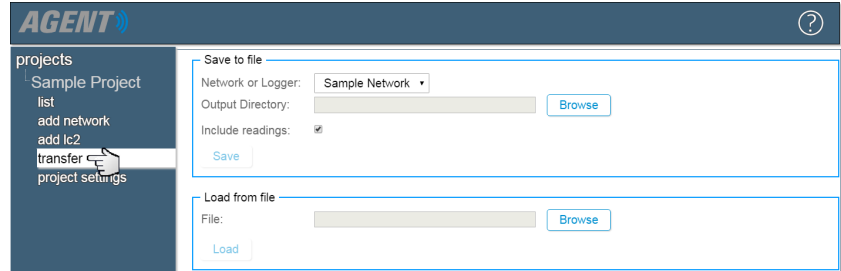


FIGURE 151: Transferring a Network

7.1 SAVE TO FILE

To save a data file, choose a GeoNet Network or LC2 datalogger to from the drop-down list next to **Network or Logger**:

Set the output directory (where the file is saved) by selecting **browse**. Go to the desired save location then select **Select Folder**. When a location is selected, it will appear in the **Output Directory** field.

NOTE: Transferred files must be saved to local drives only. Agent does not support uploading files from Network drives.

The **Include readings** box determines whether sensor readings are included in the file. Unchecking the box omits all sensor readings from the saved file. This can be used to reduce the file size.

Select **Save** to save the data to the selected location.

The name of the file is automatically generated, and includes the Network/ datalogger name, as well as the date and time the file was created. The process of saving the Network may take several minutes, depending on the amount of data being saved.

7.2 LOAD FROM A FILE

To load data from a previously saved file select **browse**, select the file to import, and then select **Load**. Confirm the transfer by selecting **Ok** in the dialog that follows. The loading process may take several minutes, depending on the amount of data contained in the file.

NOTE: After loading a GeoNet network file, the network address must be entered (see Section 3.4).

8. TROUBLESHOOTING

Listed below are a few commonly experienced problems and remedial action. Additional troubleshooting information can be found at <https://www.GEOKON.com/Videos>. Contact the factory should a problem arise not explained herein, or if additional information is needed.

Symptom: Unit will not respond to communication

- Wrong connection type or port specified in Agent.
- The internal batteries of the Gateway may be dead. Replace the batteries.

Symptom: No data for vibrating wire gauge

- Check for a faulty or misconnected gauge.
- Take a test reading by pressing the status button on the Gateway. The reading will be available for download within the next 6 minutes, depending on radio cycles and the type of Gateway.
- Using an ohmmeter, check the connections to the vibrating wire gauge leads. Consult the gauge manual for expected resistance between the gauge leads. Remember to correct for cable resistance, approximately 14.7Ω per 1000 feet (48.5Ω per km) of 22 AWG wire. Multiply this factor by two to account for both directions. If the resistance is very high or infinite, the cable is probably broken or cut. If the resistance is very low, the gauge conductors may be shorted.

Symptom: No data on the chart

Make sure that the Network Time Zone is correctly. If the wrong time zone is specified, data may be interpreted as **in the future** and not visible on charts.

Symptom: Vibrating wire gauge reading is unstable

Is there a source of electrical noise nearby (generators, motors, arc welding equipment, high voltage lines, etc.) If possible, move the transducer cable away from power lines or electrical equipment.

Symptom: Thermistor measurement shows -273.15 degrees Celsius

Indicates an open circuit to the thermistor leads. Check the connections from the datalogger to thermistor leads. If okay, check the thermistor with an ohmmeter. It should read between 10K ohms and 2.4K ohms (0° to +30° Celsius). If the thermistor reads correctly, contact the factory to schedule the unit for repair.

Symptom: Thermistor measurement is approximately double the actual ambient temperature

The thermistor value must be entered into the **Description/Notes** field of the thermistor sensor. See Section 3.7.2 for details.

Symptom: Logger has weak communication

If the signal indicated is consistently weak (red and green lights) but not intermittently red, proceed with the installation. If the signal is frequently lost (red flash) it is necessary to improve it. Try to get the Logger as high as possible with clear space around the antenna. Adding cable to the sensor will enable moving the Logger to a better location. A higher gain directional antenna may be necessary. Contact GEOKON for help.

Symptom: Logger will not synchronize with the network

If the Logger status light flashes red at one-second intervals for more than 30 seconds when the power is turned on and the network is in deploy mode, the Logger is not receiving a signal from the Gateway. Make sure the Logger is set to the same radio channel as the rest of the Network. Consult the **GeoNet System Manual** for information about setting the channel. Reset the Logger by holding down the status button for 10+ seconds until both lights turn on. Older Logger versions require the batteries to be removed and replaced for a reset.

Symptom: Data is not retrieved when the manual download button is selected

- Verify that the Network address is correct.
- If using a Cellular Network Connection, it may be necessary to recommission the Gateway or commission the Logger that is not providing data.
- If connected to a COM port, verify that the cable is still connected correctly.
- If using an exterior (add on) Network connection, verify that you can connect to the address by bringing up CMD prompt in windows. Type **ping address** (replacing **address** with the address of the Network) and hit enter. If it responses are returned the connection should be stable.

Symptom: When in the settings, the Current Network Time says Cannot Connect

Follow the same troubleshooting steps as for the previous symptom.

Symptom: Selecting the get Network settings button displays The message operation has timed out or Access is denied

Follow the same troubleshooting steps as for the previous symptom.

Symptom: Missing data

- When using a Cellular Gateway, only data that has been uploaded to the Network Server (cloud) is available for download. Data is sent from the Gateway to the Network Server in recurring intervals when a certain amount of time has passed, or a set number of readings is reached. Contact GEOKON for more information.
- Missing data may occur when the automatic download schedule is set so the download occurs at the same time sensor readings are taken. This can also occur if the automatic export schedule is identical to the automatic download schedule. As a general rule there should be a minimum of a 10-minute offset (15-minutes for large networks) between the automatic download occurring and a sensor reading or automatic export occurring. For example:

12:00 = Sensor Reading taken

12:10 = Download

12:15 = Export

Symptom: Cannot navigate in the user interface

This is a known issue in the client user interface. Press the **ALT** key on the computer.

Symptom: Cannot change the Read Interval

- Temporarily turn off automatic downloads to change the Read Interval of the network.

APPENDIX A. DETERMINE COMM PORT

A.1 RS-232 CONNECTIONS

Most of the time RS-232 connections will use COM1, but COM2 or COM3 are used if the PC has more than one internal serial port.

A.2 USB CONNECTIONS

1. Unplug the USB cable from the computer.
2. On the PC, select Start, then type **device** in the start search box.
3. Select **Device Manager** in the control panel list.
4. Select the triangle to the left of **Ports (COM & LPT)** to expand the list (Figure 152).

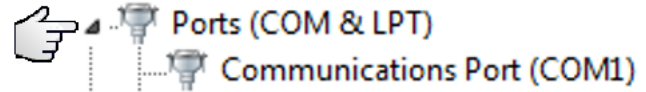


FIGURE 152: COM Port List

5. Plug the cable/adaptor into the USB port.
6. A new port will appear on the list. The COM port is shown in parentheses (see Figure 153).

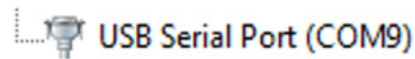


FIGURE 153: USB Port Example

APPENDIX B. MODEL DESIGNATIONS FOR LOGGER TYPES

Table 36 details the correlation between the device types available in the Logger Settings screen (Section 3.7) and GeoNet devices. This information is provided for reference only.

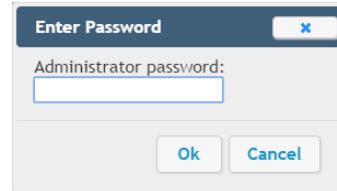
Type	Previous Designation	Associated devices
Gateway	Logger	SUP, 03G, LTM models, and legacy 8800 loggers
VW Logger	Addressable VW	01C, 04C, 08C models and ADR Loggers reading VW strings or VW interfaces
Tilt Logger	Addressable MEMS	TLT models and ADR Loggers reading MEMS IPI strings
Temp Logger	Addressable Temperature	ADR Loggers reading Model 3810A Thermistor Strings
Single Channel	Single Channel	(obsolete) Only legacy models (8800-X-XN)
Multiplexer 8 channel	8-CH Multiplexer	(obsolete) Only legacy models (8800-X-XN)
Tilt Two Axes	Tilt Two Axes	(obsolete) Only legacy models, but is compatible with Tilt Loggers

TABLE 36: Device Types Available in the Logger Settings Screen

APPENDIX C. ADVANCED SETTINGS

The Advanced Settings button in the Project settings screen allows the user to edit the internal settings of the Agent program. Advanced settings affect the entire program; they cannot be set for individual Networks or dataloggers.

Access to the settings is password protected. Select [Advanced Settings](#) to open the password dialog (Figure 154).

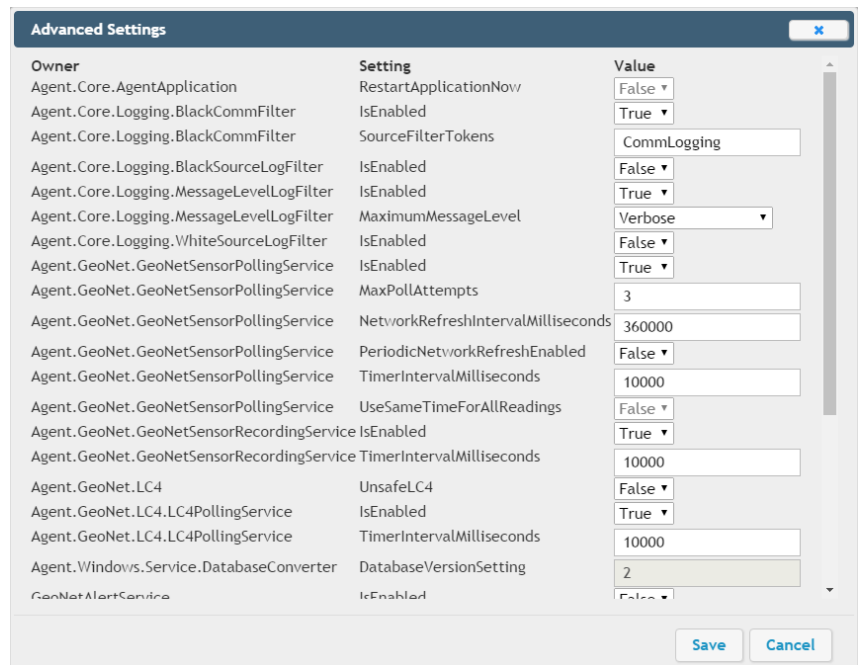


The 'Enter Password' dialog box features a title bar with a close button (X). Below the title bar, the text 'Administrator password:' is followed by a text input field. At the bottom of the dialog, there are two buttons: 'Ok' and 'Cancel'.

FIGURE 154: Password Dialog

The Administrator password is the current date in six-digit format, i.e., day, month, last two digits of the year. For example, if the current date is the third of August 2017, then the Administrator password is: 030817

When the correct password has been entered, the Advanced Settings dialog (Figure 155) will open.



The 'Advanced Settings' dialog box displays a list of settings with columns for Owner, Setting, and Value. The settings are as follows:

Owner	Setting	Value
Agent.Core.AgentApplication	RestartApplicationNow	False
Agent.Core.Logging.BlackCommFilter	IsEnabled	True
Agent.Core.Logging.BlackCommFilter	SourceFilterTokens	CommLogging
Agent.Core.Logging.BlackSourceLogFilter	IsEnabled	False
Agent.Core.Logging.MessageLevelLogFilter	IsEnabled	True
Agent.Core.Logging.MessageLevelLogFilter	MaximumMessageLevel	Verbose
Agent.Core.Logging.WhiteSourceLogFilter	IsEnabled	False
Agent.GeoNet.GeoNetSensorPollingService	IsEnabled	True
Agent.GeoNet.GeoNetSensorPollingService	MaxPollAttempts	3
Agent.GeoNet.GeoNetSensorPollingService	NetworkRefreshIntervalMilliseconds	360000
Agent.GeoNet.GeoNetSensorPollingService	PeriodicNetworkRefreshEnabled	False
Agent.GeoNet.GeoNetSensorPollingService	TimerIntervalMilliseconds	10000
Agent.GeoNet.GeoNetSensorPollingService	UseSameTimeForAllReadings	False
Agent.GeoNet.GeoNetSensorRecordingService	IsEnabled	True
Agent.GeoNet.GeoNetSensorRecordingService	TimerIntervalMilliseconds	10000
Agent.GeoNet.LC4	UnsafeLC4	False
Agent.GeoNet.LC4.LC4PollingService	IsEnabled	True
Agent.GeoNet.LC4.LC4PollingService	TimerIntervalMilliseconds	10000
Agent.Windows.Service.DatabaseConverter	DatabaseVersionSetting	2
GeoNetAlertService	IsEnabled	False

At the bottom right of the dialog, there are 'Save' and 'Cancel' buttons.

FIGURE 155: Advanced Settings

The **Owner** column describes the part of the Agent program affected. The **Setting** column shows the settings that is being changed. The **Value** column displays the current setting. Values can be numbers, text, or in some cases are selected from a drop-down box. **Note:** Some settings cannot be changed.

Saves changes to the database. No changes will take effect until the save button is pressed.

Closes the dialog and returns the settings to their previously saved configuration.

For more information on advanced settings, contact GEOKON.

APPENDIX D. CEFSHARP LICENSE

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APPENDIX E. CALIBRATION DATA API

GEOKON maintains a Calibration Data web API that can be used to programmatically retrieve calibration data for select instruments. It enables automated population of coefficients necessary to convert instrument data to engineering units in GEOKON's Agent and third-party software. In the past, calibration coefficients were provided in hard copy and required manual entry that is both time consuming and prone to error.

The root of the Calibration Data API URL is "<http://cal.GEOKON.com/apiv1>" with the remainder of the path consisting of an abbreviation for the type of sensor and the serial number of the instrument as a parameter. Table 37 shows the current instrument types and date ranges that exist in the database.

Type	Example Model #s	Path	Start Date
Piezometer	4500S, 4500SH, 4500AL(V)	/piezo/	January 3, 2017
Rebar Strainmeters	4911, 4911A	/strainmeters/ or /displacement/	January 3, 2017
Load Cells	4900, 4915	/loadcell/	April 4, 2018
MEMS IPI	6150E, 6180	/tilt/	November 28, 2017

TABLE 37: Current Calibration Data Available

Below are example URLs for each type, with a real serial number for testing:

<http://cal.geokon.com/apiv1/LoadCell/?sn=2043484>

<http://cal.geokon.com/apiv1/sticks/?sn=1732933>

<http://cal.geokon.com/apiv1/piezo/?sn=2133605>

<http://cal.geokon.com/apiv1/LoggerInfo/?sn=2126469>

<http://cal.geokon.com/apiv1/rebar/?sn=2133179>

<http://cal.geokon.com/apiv1/vwtiltmeter/?sn=2121256>

<http://cal.geokon.com/apiv1/MEMSPolyCoefficients/?sn=2262120>

<http://cal.geokon.com/apiv1/MEMSPolynomial/?sn=2140324>

Note: MEMSLinear cutoff date is September 08 2022.

<http://cal.geokon.com/apiv1/MEMSLinear/?sn=2121414>

Note: MEMSPolynomial cutoff date is December 21 2022.

Trying to navigate to these addresses with a browser will usually display the data in xml format which is human readable and is a good test of a properly formed URL. Figure 156 shows a typical response in Chrome.

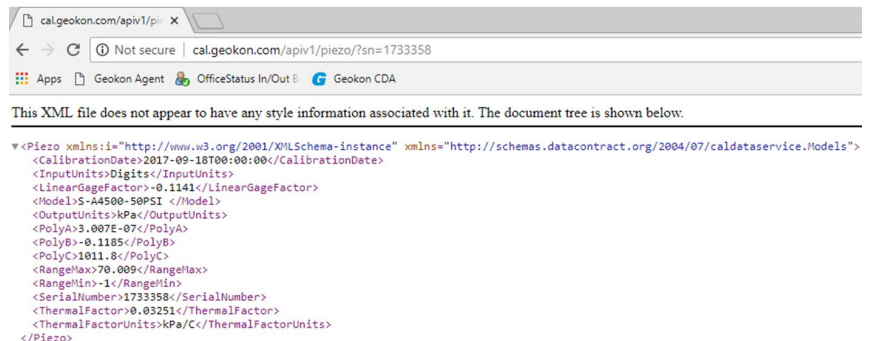


FIGURE 156: Typical XML Format Response

The following C# code example illustrates how to obtain serialized calibration data with the option of json or xml format:

```
private string GetCalibrationData(string url, int serialNumber, bool json)
{
    try
    {
        url = url + $"//?sn={serialNumber}"; // build the URL from the base
and serial number as a parameter

        HttpWebRequest webRequest = WebRequest.Create(url) as
HttpWebRequest;

        if (webRequest == null) return null; // abort if unable to create
the request object

        webRequest.ContentType = $"application/({(json ? "json" : "xml")});
charset=utf-8"; // select the type of response, json or xml

        webRequest.Method = "GET";

        WebResponse response = webRequest.GetResponse();

        using (Stream responseStream = response.GetResponseStream())
        {
            if (responseStream == null) return "the server replied but the
response stream is null";
            StreamReader reader = new StreamReader(responseStream,
Encoding.UTF8);
            return reader.ReadToEnd();
        }
    }
    catch (Exception ex)
    {
        return ex.Message;
    }
}
```

The response can then be de-serialized into the appropriate object. A number of tools exist to generate the classes from the json, as shown in Figure 157.

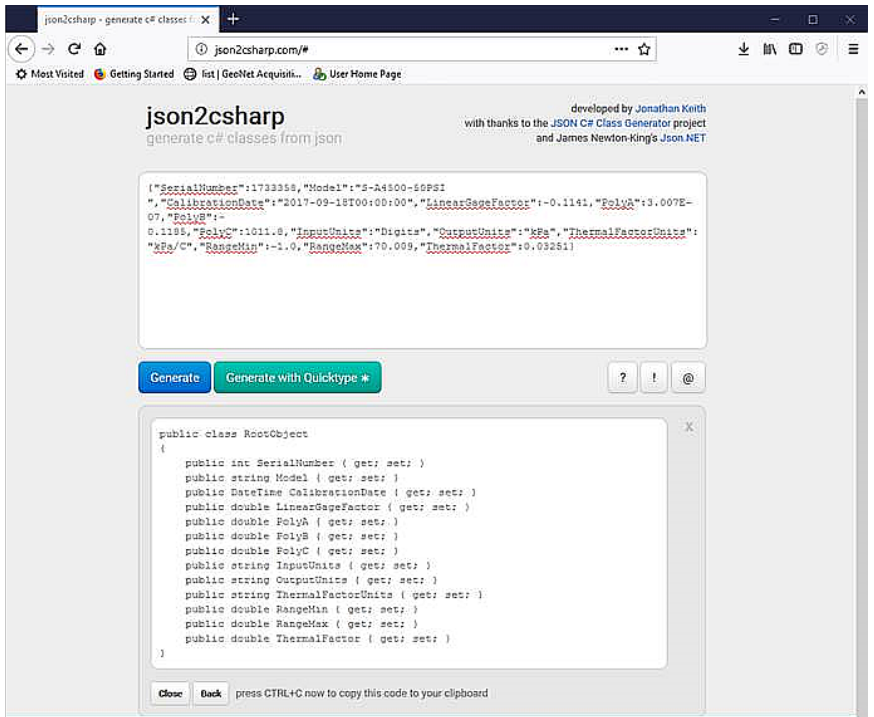


Figure 157: *Json2csharp Example*

