



Campbell Scientific Hydro-Link Hands on Training

NOAA Joint Satellite Conference Oct 2019, Boston Mass

Overview

- **1 - Introduction to Hydro-Link**
- **2 - Introducing the CR300 Datalogger / DCP**
- **3 - Downloading Hydro-Link**
- **4 - Connecting to Hydro-Link**
- **5 - Configuring the DCP Using Hydro-Link**
- **6 - Using the Hydro-Link Dashboard**
- **7 - Using the Hydro-Link Data Monitor**
- **8 - Using Hydro-Link Diagnostics**
- **9 - Conclusion**

Introduction to the DCP



Shown is the CR300 datalogger mounted on top of the TX321 GOES transmitter

GOES transmitters provided by Campbell Scientific are CS2 Certified and support both timed and random transmissions

The CR300 datalogger provides analog and digital inputs for sensor connections and provides for different communication options including GOES, Cell and Iridium

Introduction to Hydro-Link

- **Complete DCP Configuration Tool**
 - **Point and Click User Interface**
 - **Simple Library of Sensors**
 - **Multiple Communication Options**
- **Hands on Field Tool**
 - **Real-Time Measurements**
 - **Calibration Options**
 - **Data Retrieval Options**
 - **Diagnostic Services**
 - **Data Presentation Options**

Hydro-Link Advantages

- Simple Download
 - ZIP File or Install File, Which is best for you

- Free
 - Allows all technicians to have the same tool

- Independent of PC
 - Configure on a PC, Continue on another PC

- Independent of Device
 - Use Smart Phones or Tablets

Limitations of Hydro-Link

- Currently works on CR300 series loggers, future plans may include other loggers.
- The current set of sensors in the library is limited. With the “generic” options in the library, all standard sensors are supported. The library will grow with the needs of the customer.



Downloading Hydro-Link

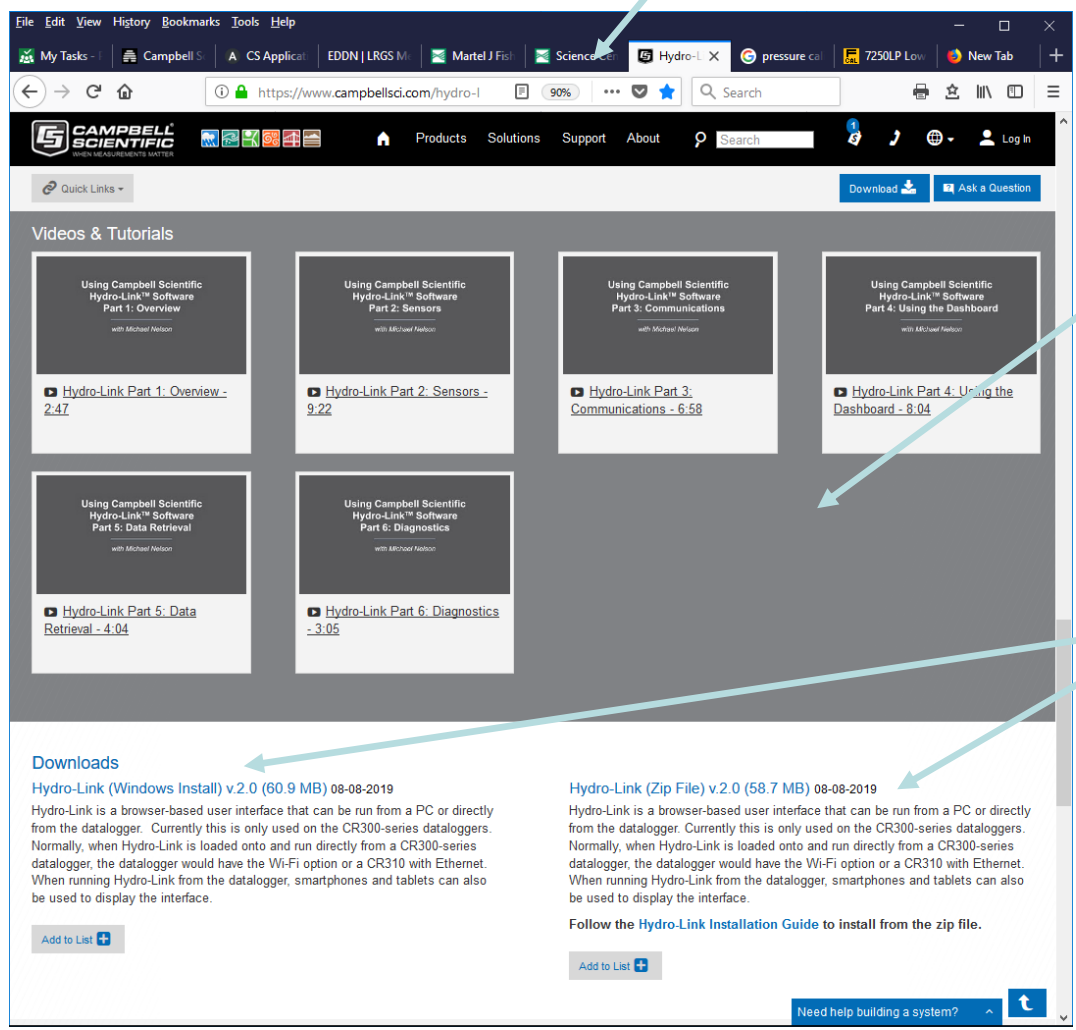
The link: <https://www.campbellsci.com/hydro-link>

The screenshot shows the Hydro-Link product page. At the top, there is a navigation bar with 'Products', 'Solutions', 'Support', and 'About'. Below this, the product name 'Hydro-Link' is displayed with a 'Download' button. The main content area features a 'Dashboard' preview and a 'Menu-Based Interface' description. At the bottom, there is a 'Downloads' section with a 'Downloads' link in the navigation menu. A red arrow points from the URL above to the browser address bar. Another red arrow points from the 'Downloads' section to the 'Downloads' link in the navigation menu.

Jump to the Download Options or scroll down and find them

Downloading Hydro-Link

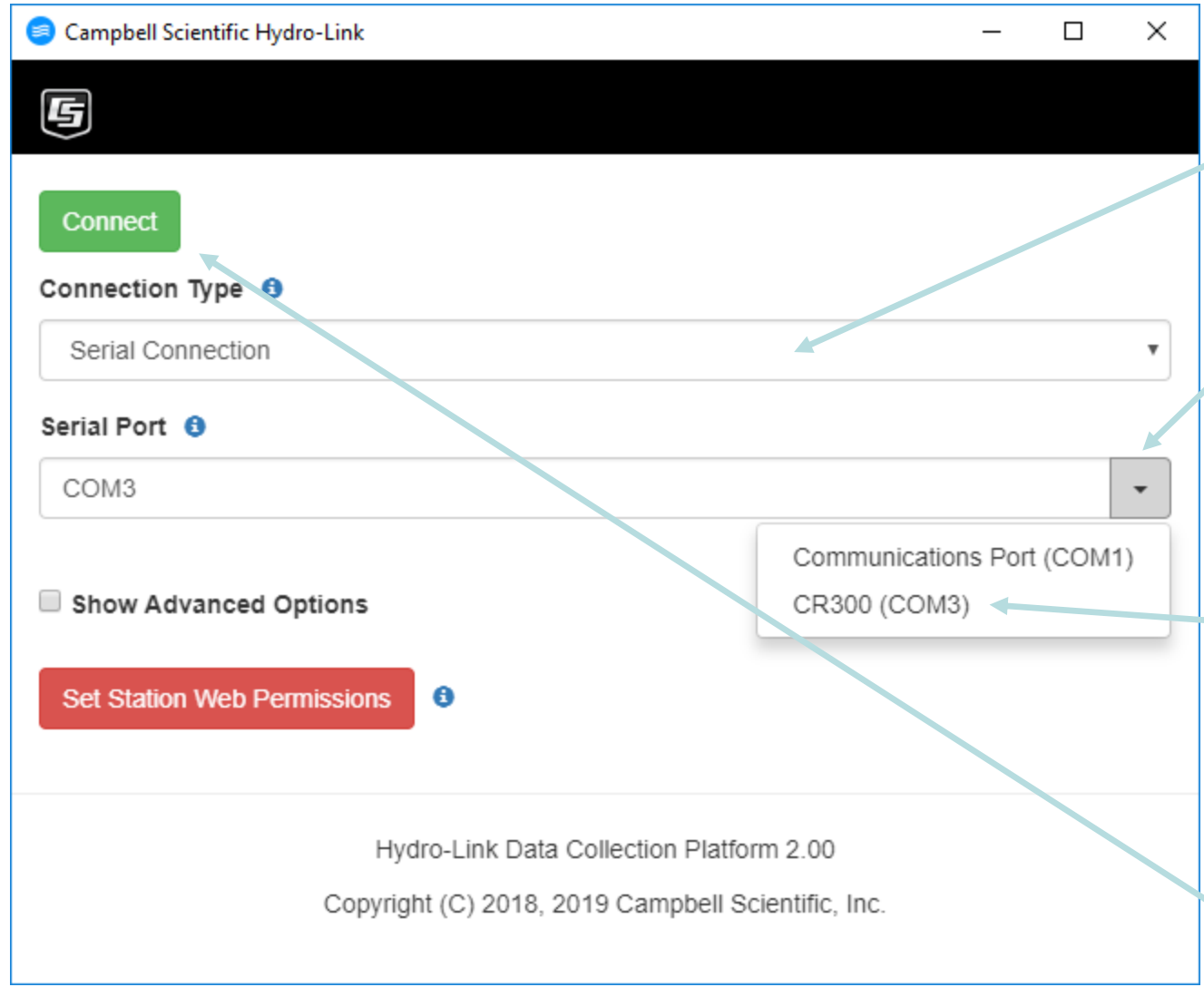
The link: <https://www.campbellsci.com/hydro-link>



Scrolling down shows other information on the interface, Here are some training videos on using Hydro-Link

Download Options: A ZIP File or a Windows Install File

Hydro-Link, Connect Screen - Serial



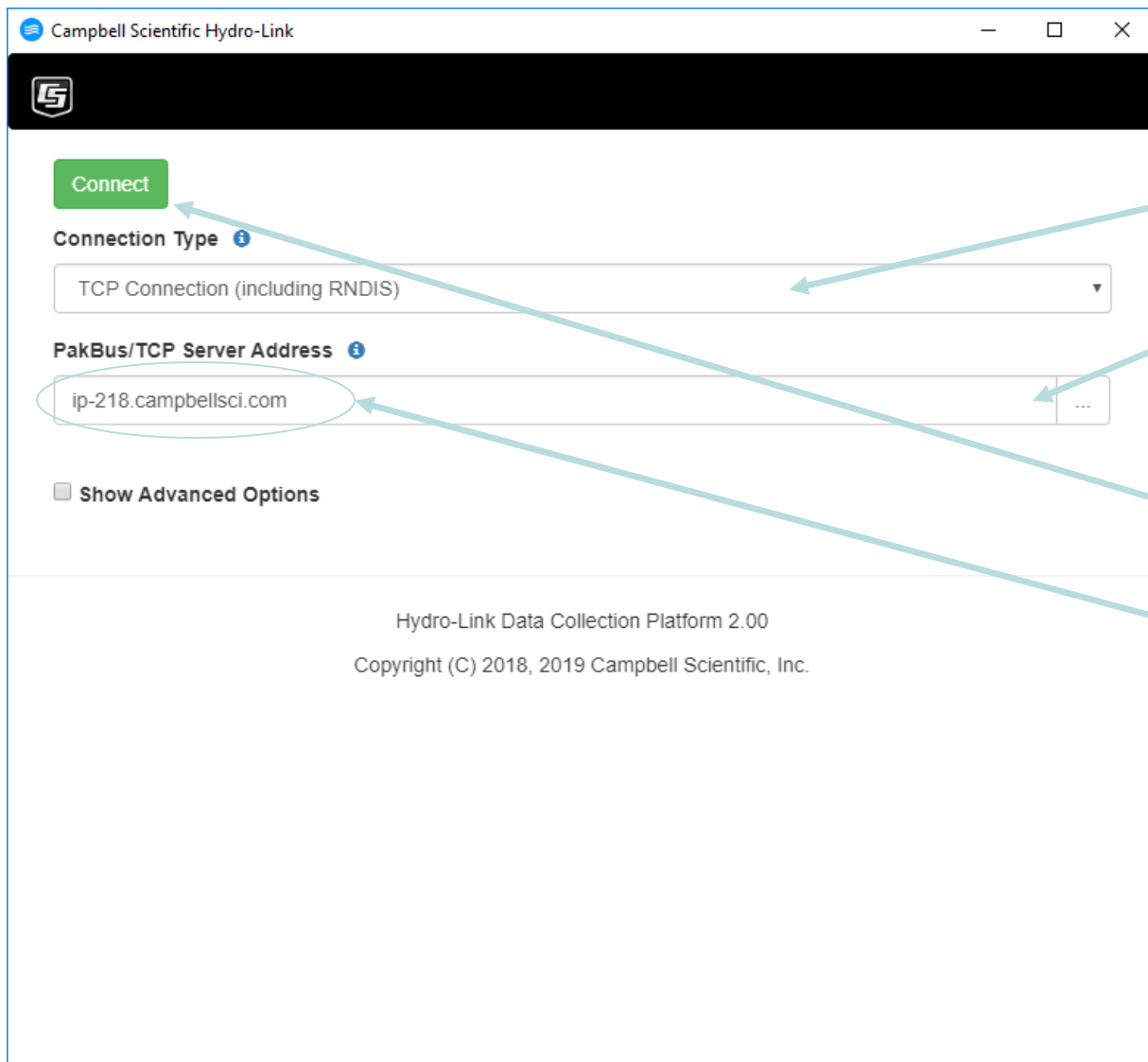
Use the USB serial connection

Use the dropdown option to see the available com ports

Select the CR300

With the CR300 connected, press the "Connect" button

Hydro-Link, Connect Screen - TCP



Campbell Scientific Hydro-Link

Connect

Connection Type ⓘ

TCP Connection (including RNDIS)

PakBus/TCP Server Address ⓘ

ip-218.campbellsci.com

Show Advanced Options

Hydro-Link Data Collection Platform 2.00
Copyright (C) 2018, 2019 Campbell Scientific, Inc.

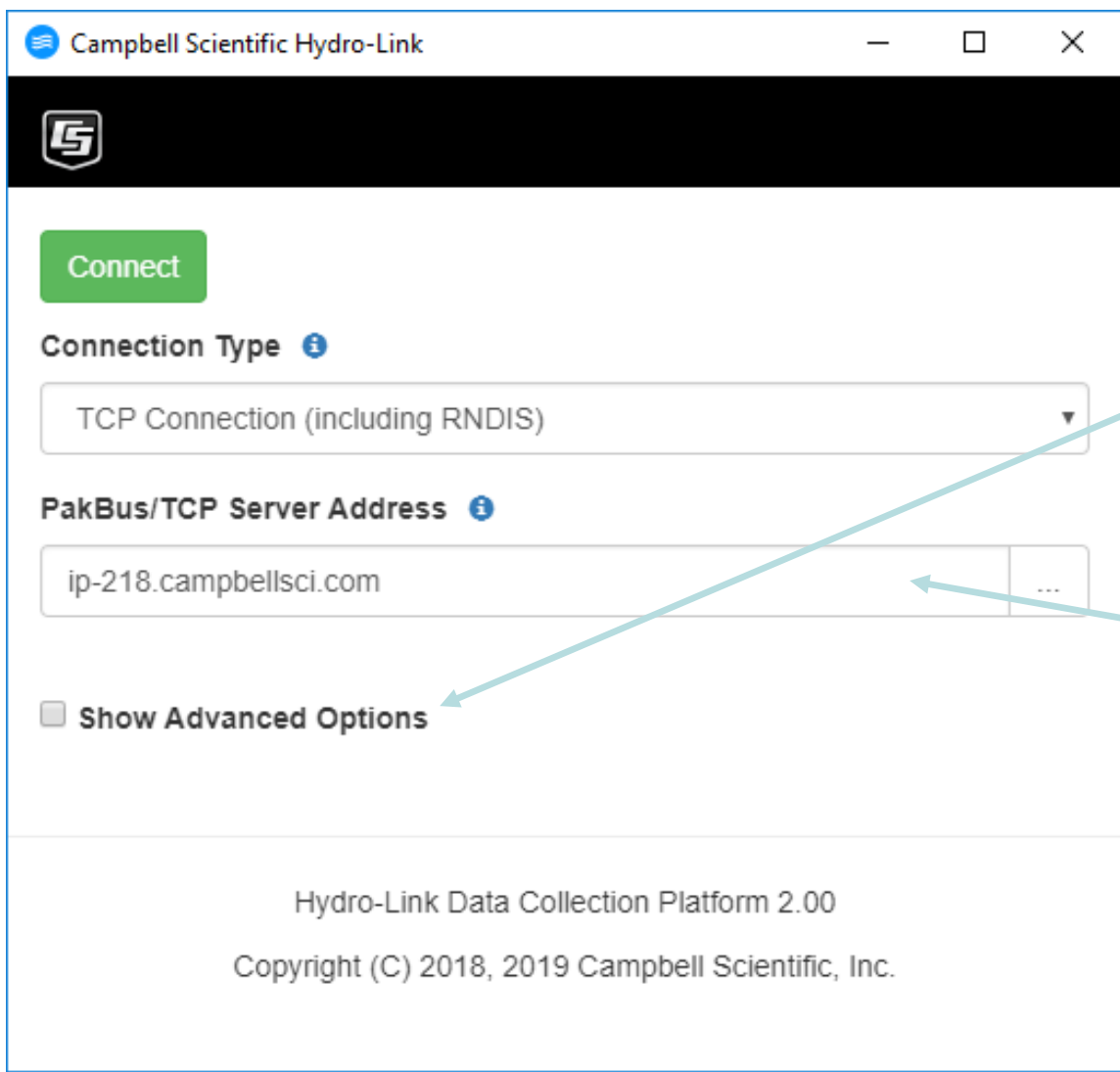
Use a wireless or internet connection

Enter the address of the datalogger

Press the “Connect” button

NOTE: This address is a test site in Logan Utah that may be accessed for live demos.

Datalogger Security

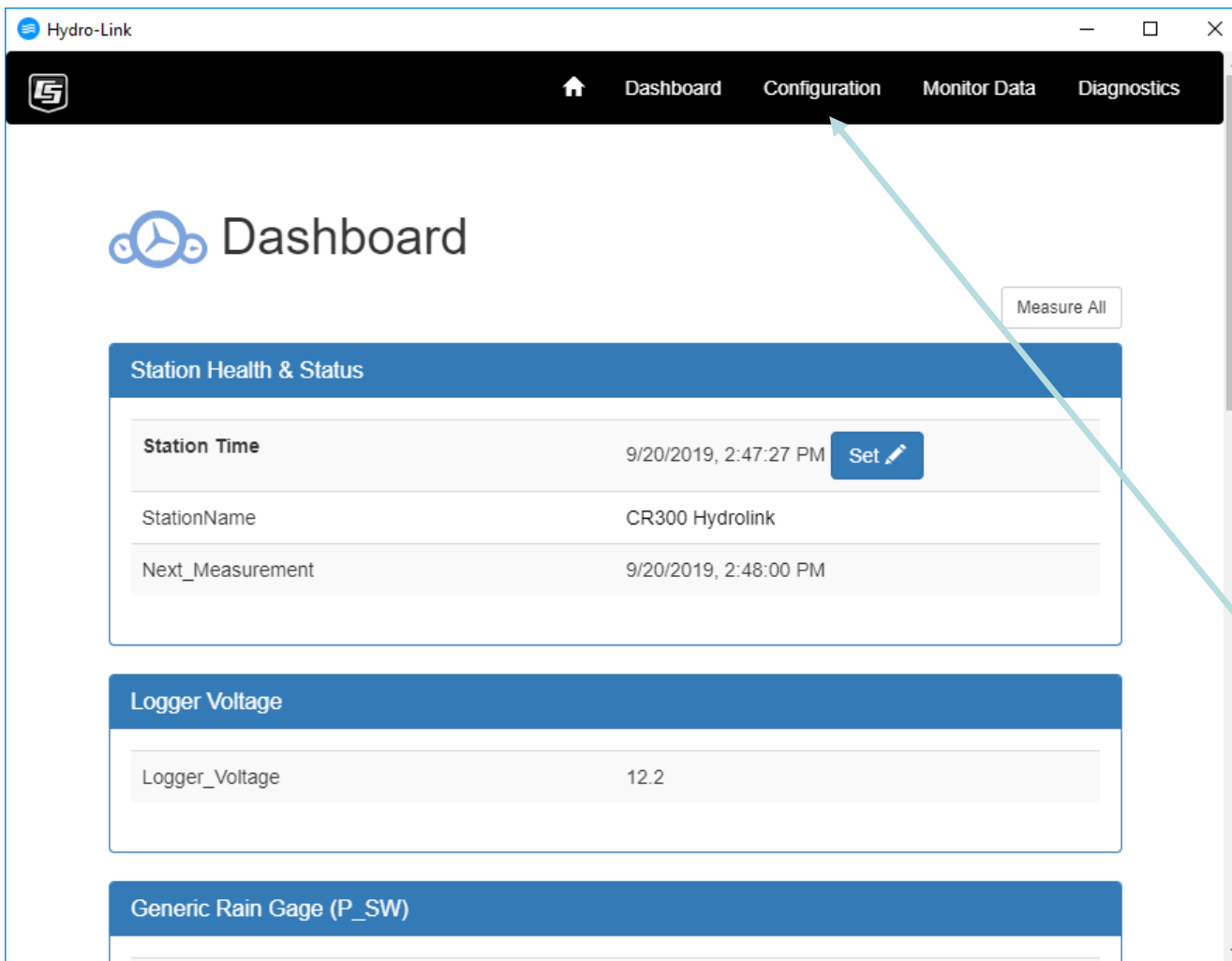


The screenshot shows the Campbell Scientific Hydro-Link web interface. At the top left is the Campbell Scientific logo. Below it is a green 'Connect' button. The 'Connection Type' dropdown menu is set to 'TCP Connection (including RNDIS)'. The 'PakBus/TCP Server Address' field contains 'ip-218.campbellsci.com'. There is a 'Show Advanced Options' checkbox which is currently unchecked. At the bottom, it says 'Hydro-Link Data Collection Platform 2.00' and 'Copyright (C) 2018, 2019 Campbell Scientific, Inc.'.

Some advanced options are used to set the password for the station when using an HTTP connection

On this demo site:
The User name is admin
The password is admin

Dashboard




Hydro-Link

Dashboard Configuration Monitor Data Diagnostics

Dashboard

Measure All

Station Health & Status

Station Time	9/20/2019, 2:47:27 PM	Set 
StationName	CR300 Hydrolink	
Next_Measurement	9/20/2019, 2:48:00 PM	

Logger Voltage

Logger_Voltage	12.2
----------------	------

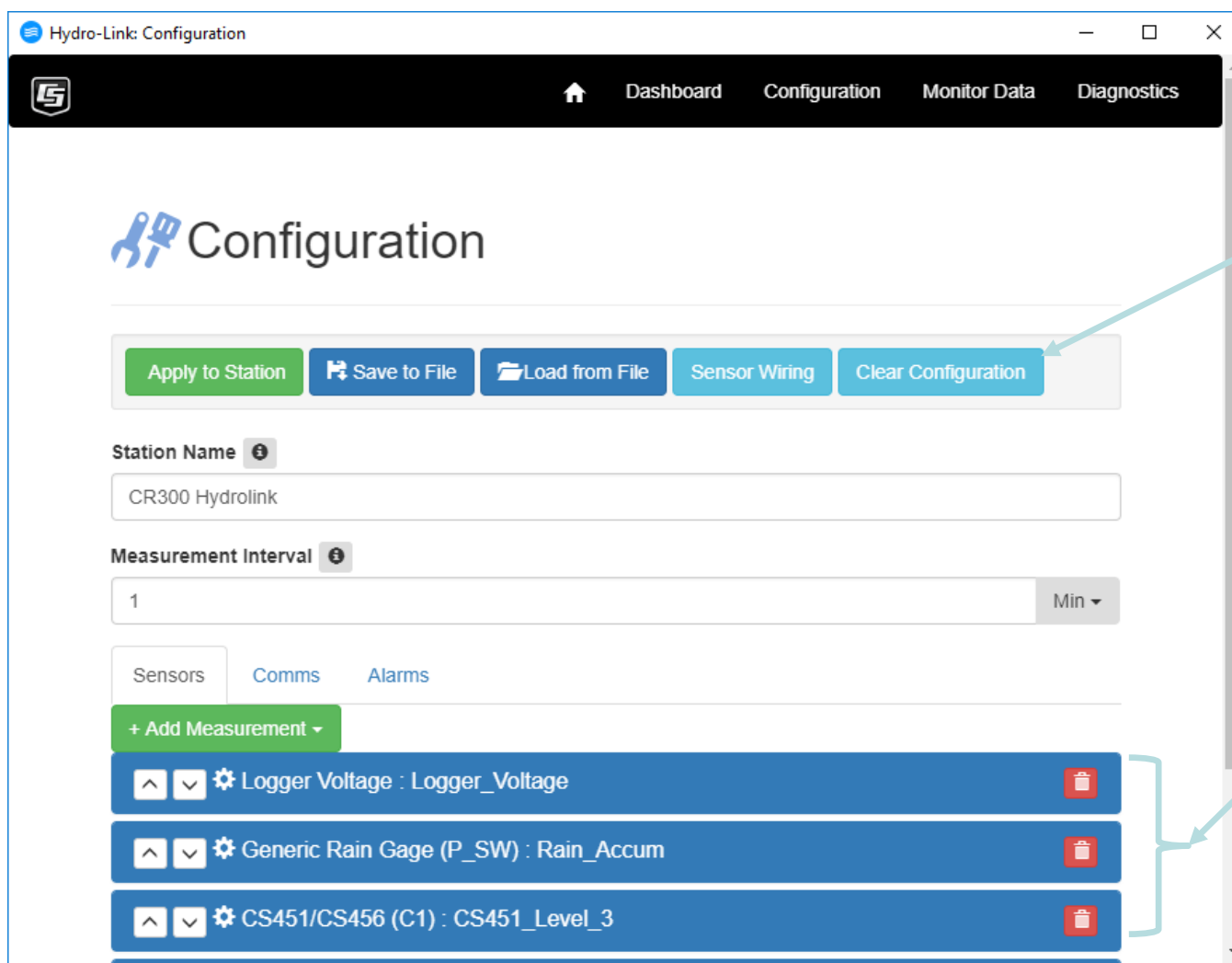
Generic Rain Gage (P_SW)

Normally after pressing the **Connect** button, the Dashboard is displayed.

The **Dashboard** layout is based on the current configuration.

To start a new **Configuration** select this option

Configuration - 1



Hydro-Link: Configuration

Dashboard Configuration Monitor Data Diagnostics

Configuration

Apply to Station Save to File Load from File Sensor Wiring Clear Configuration

Station Name ⓘ
CR300 Hydrolink

Measurement Interval ⓘ
1 Min ▾

Sensors Comms Alarms

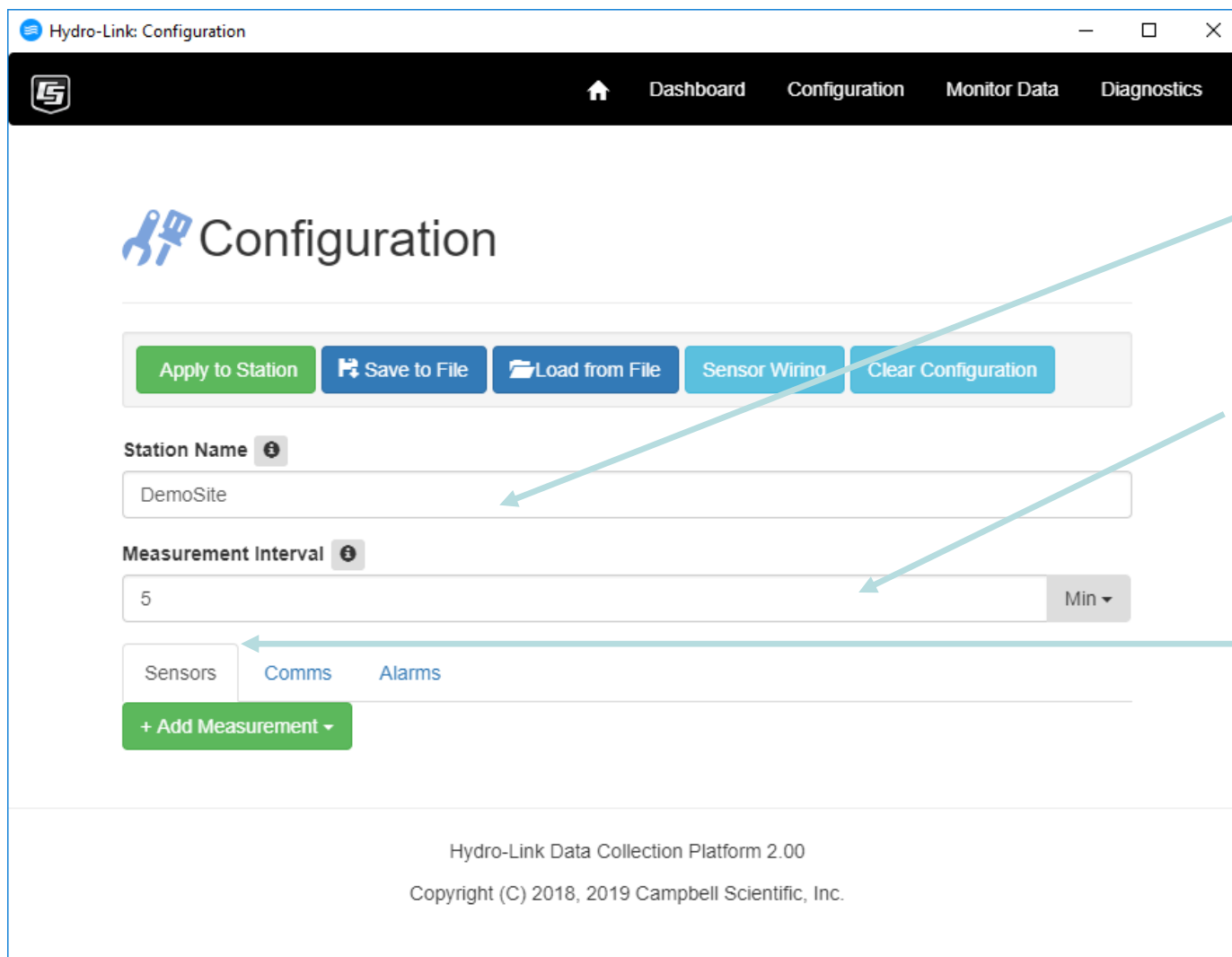
+ Add Measurement ▾

- Logger Voltage : Logger_Voltage
- Generic Rain Gage (P_SW) : Rain_Accum
- CS451/CS456 (C1) : CS451_Level_3

For a new configuration, we will want to clear out the current settings, use this option to clear the current options.

Once the **Clear Configuration** option has been used the current settings will be cleared out.

Configuration - 2



Hydro-Link: Configuration

Dashboard Configuration Monitor Data Diagnostics

Configuration

Apply to Station Save to File Load from File Sensor Wiring Clear Configuration

Station Name ⓘ
DemoSite

Measurement Interval ⓘ
5 Min ▾

Sensors Comms Alarms

+ Add Measurement ▾

Hydro-Link Data Collection Platform 2.00
Copyright (C) 2018, 2019 Campbell Scientific, Inc.

Enter in a **Station Name** for the new application.

Enter in a **Measurement rate**.

Now we are ready to add sensors.

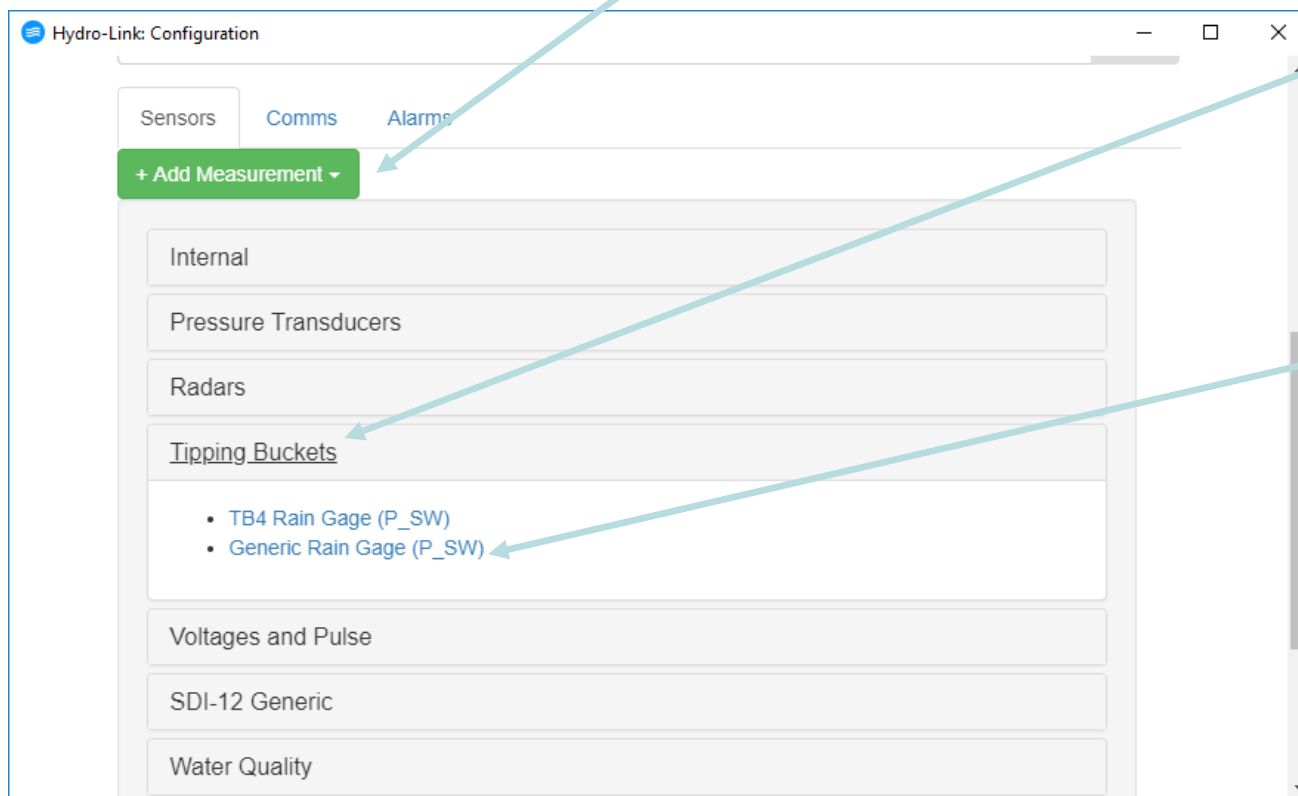
Configuration - 3

To add a Rain Gauge,
first press the **Add
Measurement** option

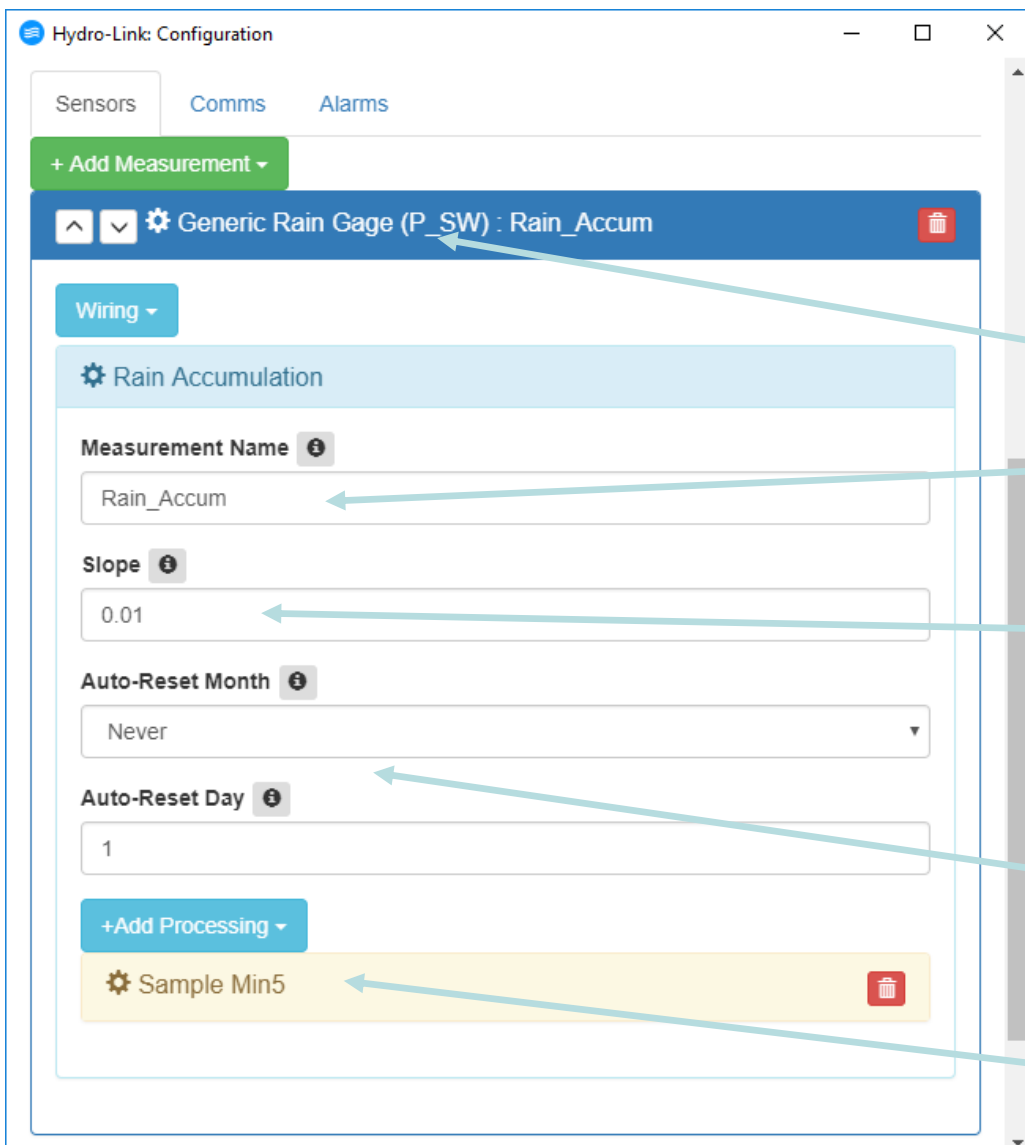
Next select the
Tipping Buckets
option

Then select the
**Generic Rain
Gauge** option,

Notice the (P_SW)
label indicating what
connection this is
on the datalogger



Configuration - 4



Hydro-Link: Configuration

Sensors Comms Alarms

+ Add Measurement ▾

Generic Rain Gage (P_SW) : Rain_Accum

Wiring ▾

Rain Accumulation

Measurement Name ⓘ
Rain_Accum

Slope ⓘ
0.01

Auto-Reset Month ⓘ
Never

Auto-Reset Day ⓘ
1

+Add Processing ▾

Sample Min5

A dialog box will be displayed allowing the user to make specific changes to the rain gauge. Once the options are complete, click on the **title bar** to minimize the options

Enter in the name to use for the data identifier

Enter in the count per tip

If the rain accumulator is to be automatically reset, select a month and day for the reset to occur

Normally the processing can be left at the default settings

Configuration - 5

Hydro-Link: Configuration

Sensors Comms Alarms

+ Add Measurement

Generic Rain Gage (P_SW) : Rain Accum

Wiring

Rain Accumulation

Measurement Name Rain_Accum

Slope 0.01

Auto-Reset Month Never

Auto-Reset Day 1

+Add Processing

Sample Min5

Click the **Wiring** button to see how to wire in the sensor

Hydro-Link: Configuration

Generic Rain Gage (P_SW) : Rain_Accum

Wiring

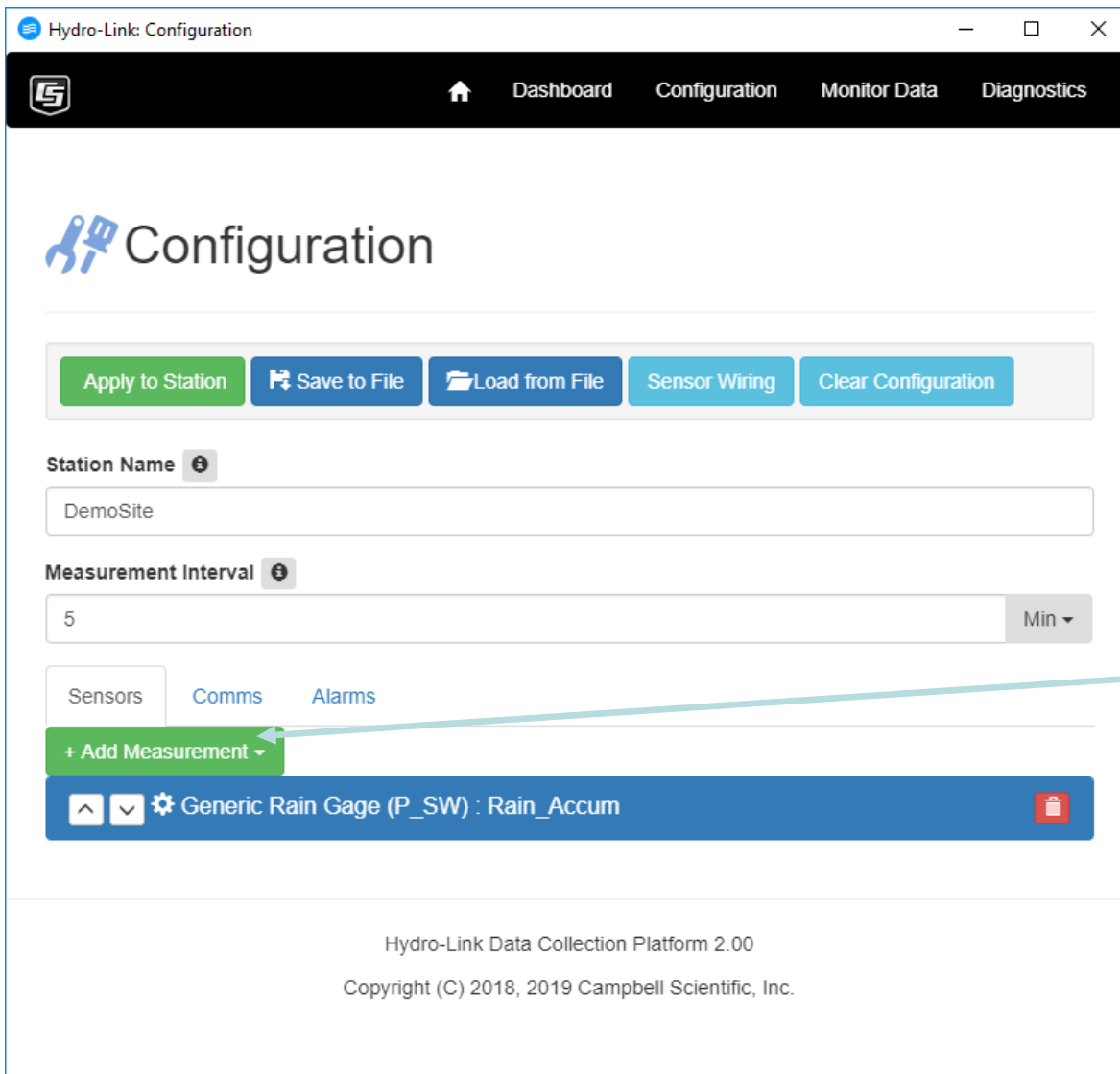
Wire Color	Datalogger Terminal	Function
Unknown	P_SW	Signal
Unknown	G	Signal Reference
Unknown	G	Shield

An image of the datalogger will be displayed with the wiring outlined

Click the **Wiring** button again to close this window

Click on the rain gauge title bar to minimize these options

Configuration - 6



Hydro-Link: Configuration

Dashboard Configuration Monitor Data Diagnostics

Configuration

Apply to Station Save to File Load from File Sensor Wiring Clear Configuration

Station Name ⓘ
DemoSite

Measurement Interval ⓘ
5 Min ▾

Sensors Comms Alarms

+ Add Measurement ▾

Generic Rain Gage (P_SW) : Rain_Accum

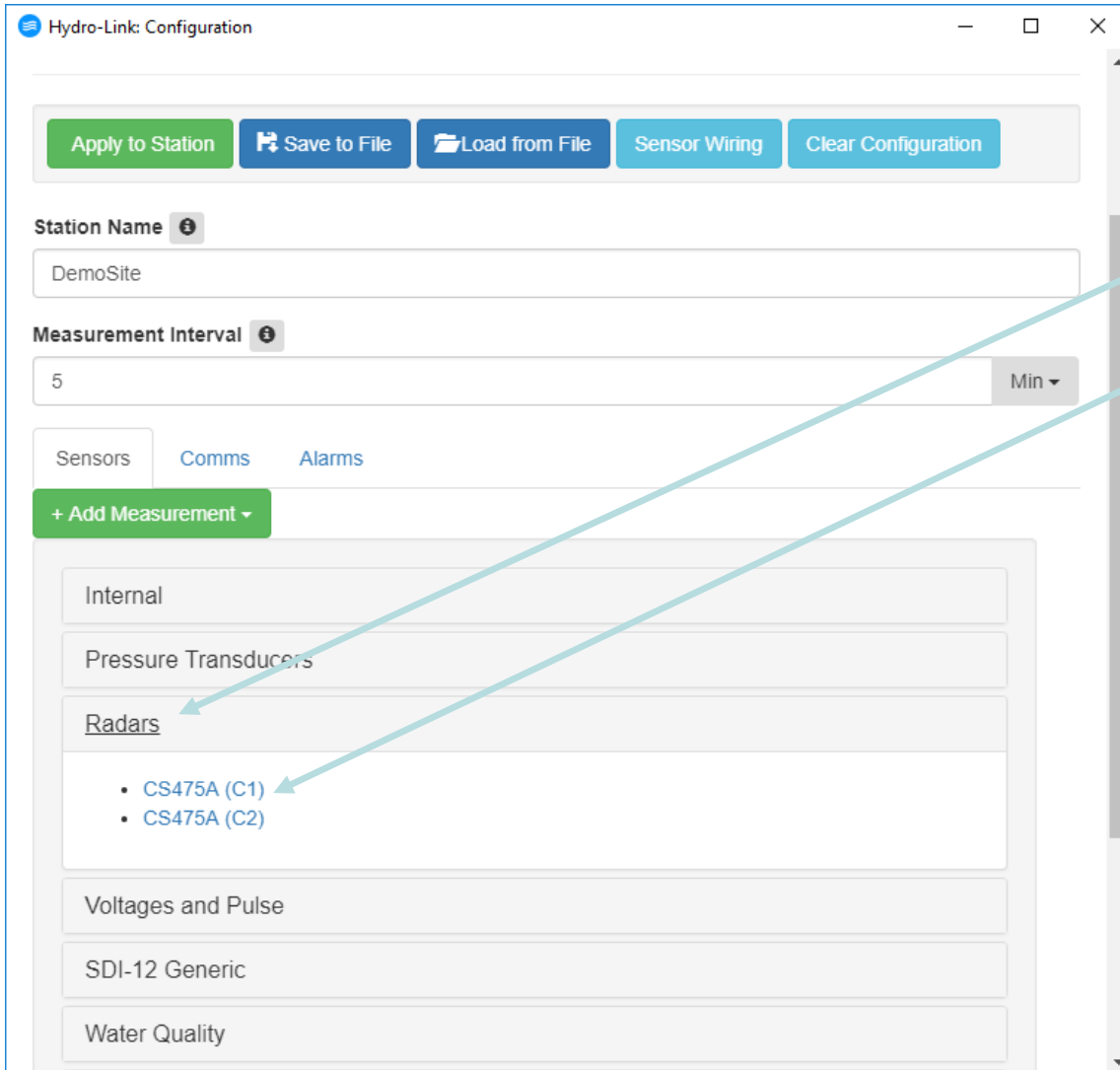
Hydro-Link Data Collection Platform 2.00
Copyright (C) 2018, 2019 Campbell Scientific, Inc.

The rain gauge is now configured and the options for the rain gauge are minimized

Now add in a water level sensor. For this we will use the CS475A radar sensor


Click **Add Measurement** to start

Configuration - 7




Hydro-Link: Configuration

Apply to Station Save to File Load from File Sensor Wiring Clear Configuration

Station Name 

DemoSite

Measurement Interval 

5 Min

Sensors Comms Alarms

+ Add Measurement

Internal

Pressure Transducers

Radars

- CS475A (C1)
- CS475A (C2)

Voltages and Pulse

SDI-12 Generic

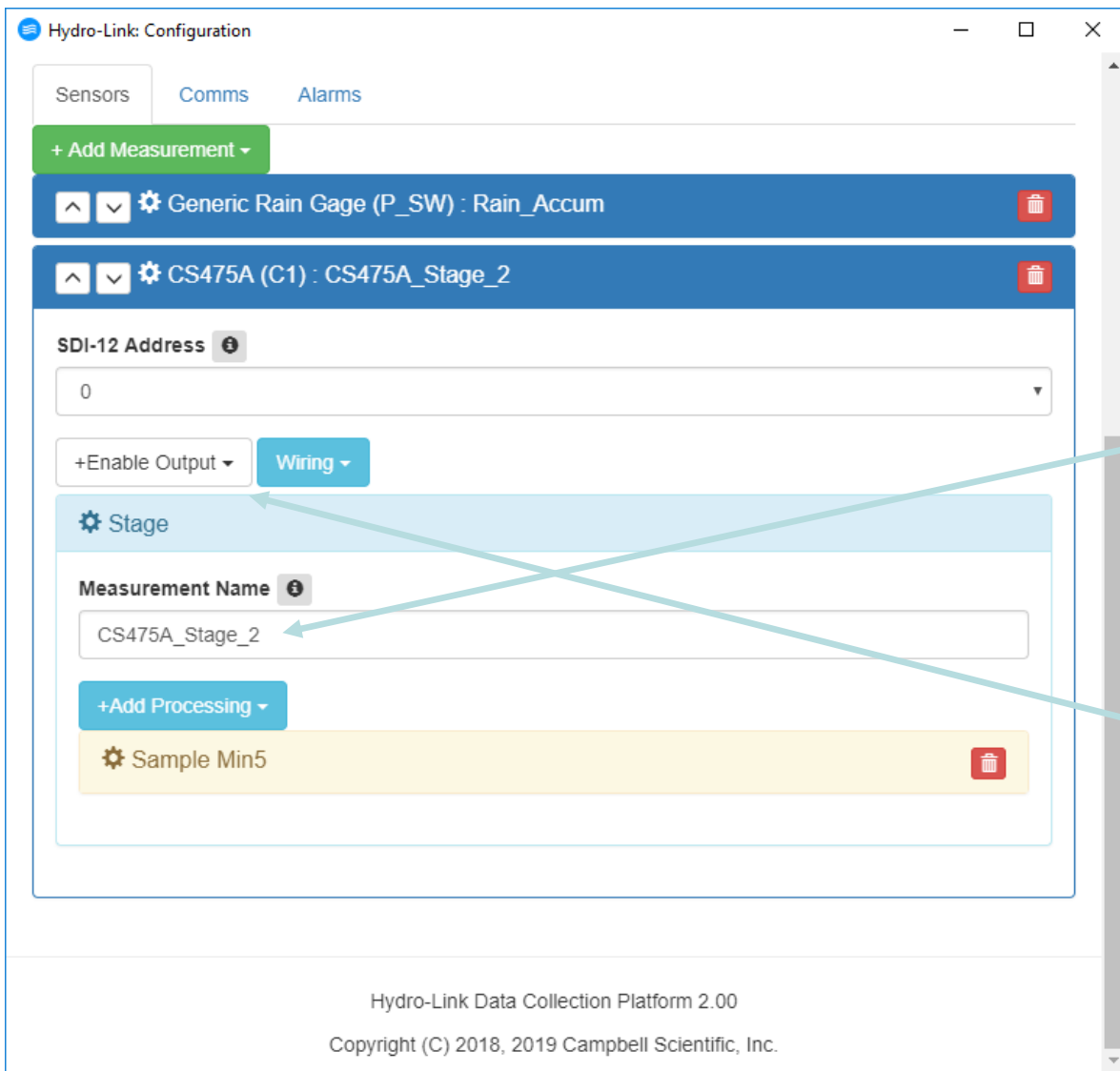
Water Quality

With the sensor library options displayed, Select the **Radars** option

Then select **CS475A (C1)**

This is an SDI-12 sensor that will be connected to the C1 terminal

Configuration - 8



Hydro-Link: Configuration

Sensors Comms Alarms

+ Add Measurement ▾

Generic Rain Gage (P_SW) : Rain_Accum

CS475A (C1) : CS475A_Stage_2

SDI-12 Address ⓘ

0

+Enable Output ▾ Wiring ▾

Stage

Measurement Name ⓘ

CS475A_Stage_2

+Add Processing ▾

Sample Min5

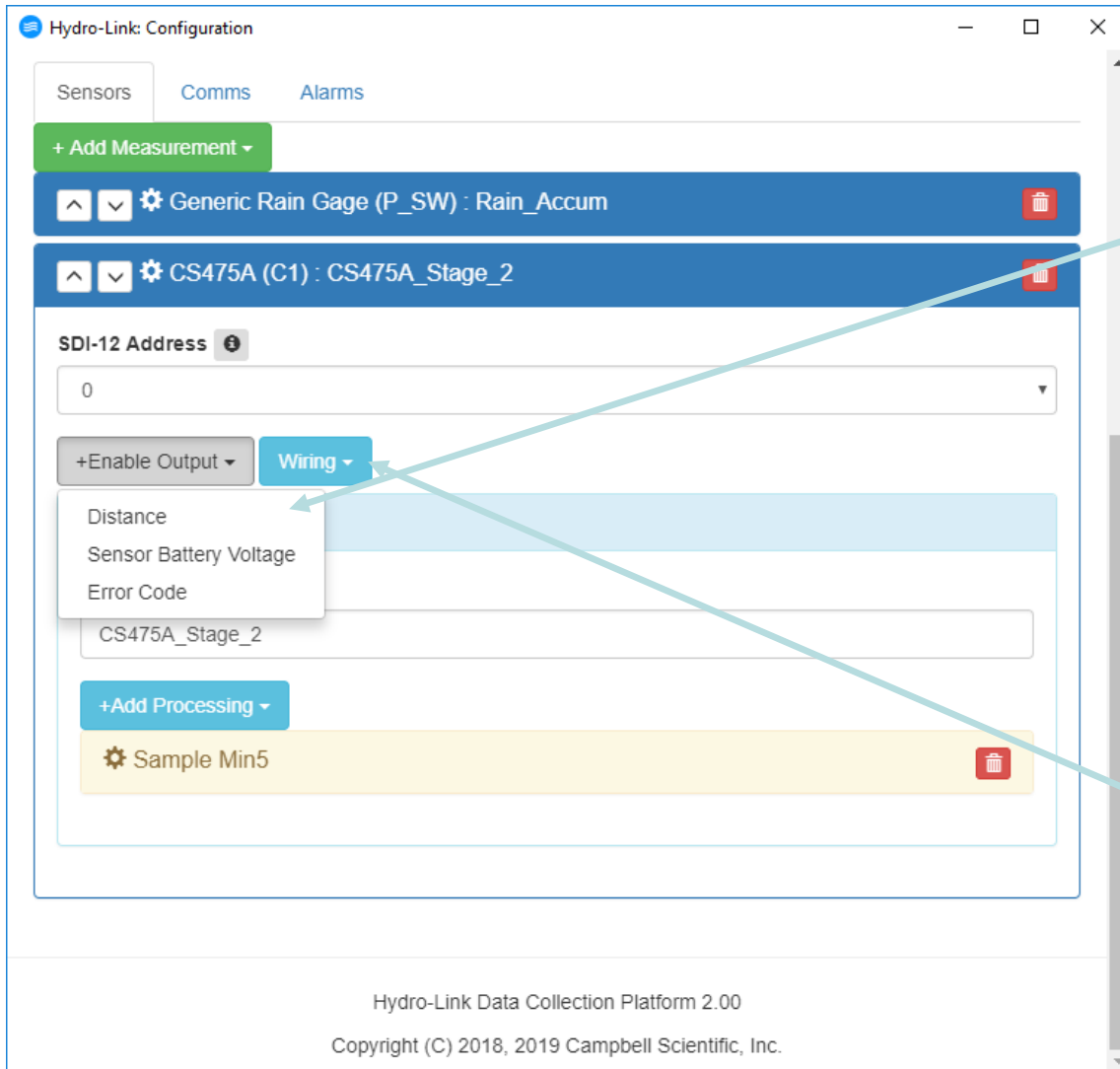
Hydro-Link Data Collection Platform 2.00
Copyright (C) 2018, 2019 Campbell Scientific, Inc.

A new dialog box will be displayed showing the options to setup the radar sensor

Enter the name to use to identify the data value, the default value may also be used

The radar gauge has other output values, to enable one of them, select the **Enable Output** button

Configuration - 9



The screenshot shows the 'Hydro-Link: Configuration' window with three tabs: 'Sensors', 'Comms', and 'Alarms'. The 'Sensors' tab is active. At the top, there is a '+ Add Measurement' button. Below it, two sensor entries are listed: 'Generic Rain Gage (P_SW) : Rain_Accum' and 'CS475A (C1) : CS475A_Stage_2'. The 'CS475A (C1) : CS475A_Stage_2' entry is selected. Underneath, there is an 'SDI-12 Address' field with the value '0'. Below that, there is a '+Enable Output' button and a 'Wiring' button. The 'Wiring' button is highlighted in blue, and a dropdown menu is open below it, showing three options: 'Distance', 'Sensor Battery Voltage', and 'Error Code'. Below the dropdown, there is a text field containing 'CS475A_Stage_2'. At the bottom of the sensor configuration area, there is a '+Add Processing' button and a 'Sample Min5' entry with a gear icon and a trash icon. The footer of the window reads 'Hydro-Link Data Collection Platform 2.00' and 'Copyright (C) 2018, 2019 Campbell Scientific, Inc.'

Additional output options are displayed here

Select an output and configure it using the options in the new dialog box that pops up

For this example, no other outputs will be used

Press the **Wiring** button to see how this sensor is wired to the datalogger

Configuration - 10

Hydro-Link: Configuration

CS475A (C1) : CS475A_Stage_2

SDI-12 Address

+Enable Output **Wiring**

Wire Color	Datalogger Terminal	Function
Red	BAT+	Power
Black	BAT-	Power Ground
White	C1	SDI-12 Signal
Clear	G	Shield

An image of the datalogger is displayed showing the connections for the wires.

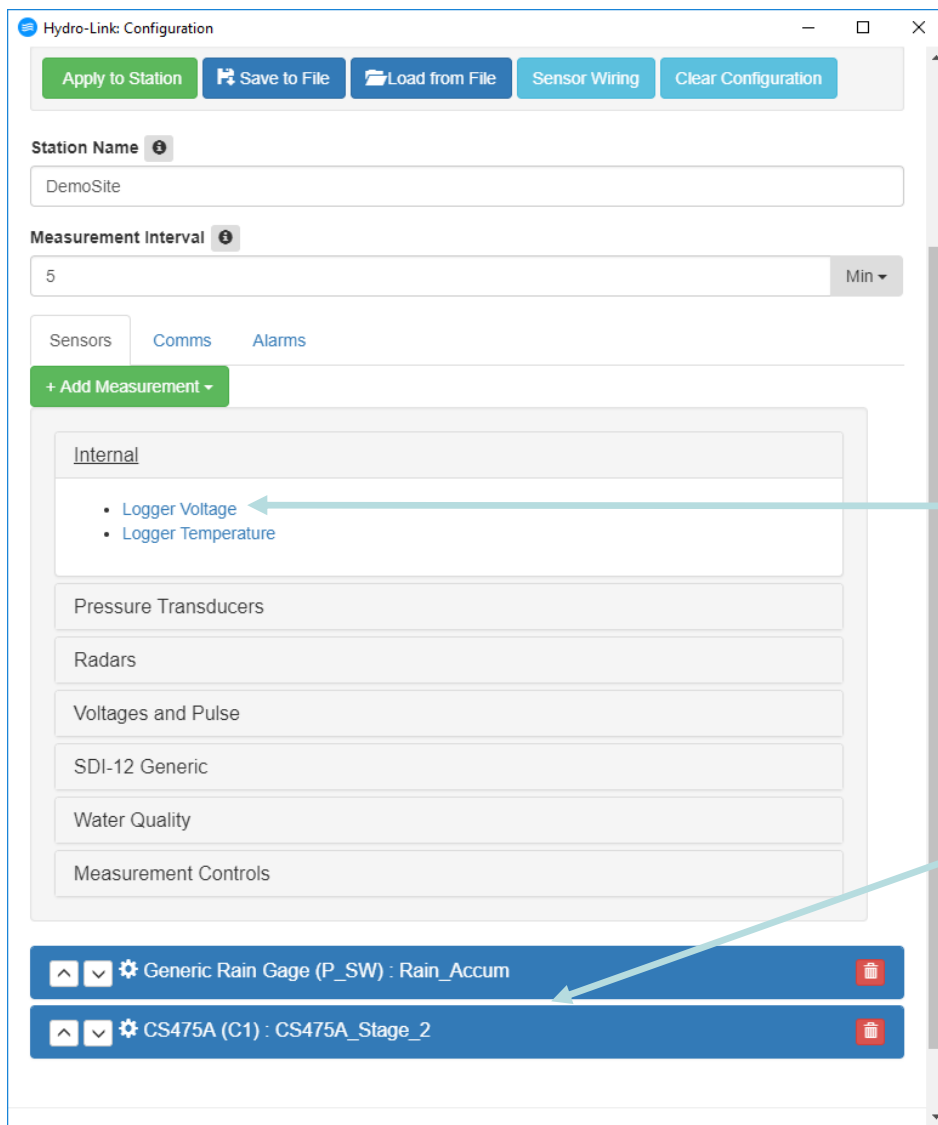
Also shown is a wiring table for this sensor

Clicking on the **Wiring** button again will cause the window to be removed.

The radar gauge is setup

Clicking on the **CS475A** title bar will cause the complete dialog box to be collapsed

Configuration - 11



Hydro-Link: Configuration

Apply to Station Save to File Load from File Sensor Wiring Clear Configuration

Station Name DemoSite

Measurement Interval 5 Min

Sensors Comms Alarms

+ Add Measurement

Internal

- Logger Voltage
- Logger Temperature

Pressure Transducers

Radars

Voltages and Pulse

SDI-12 Generic

Water Quality

Measurement Controls

Generic Rain Gage (P_SW) : Rain_Accum

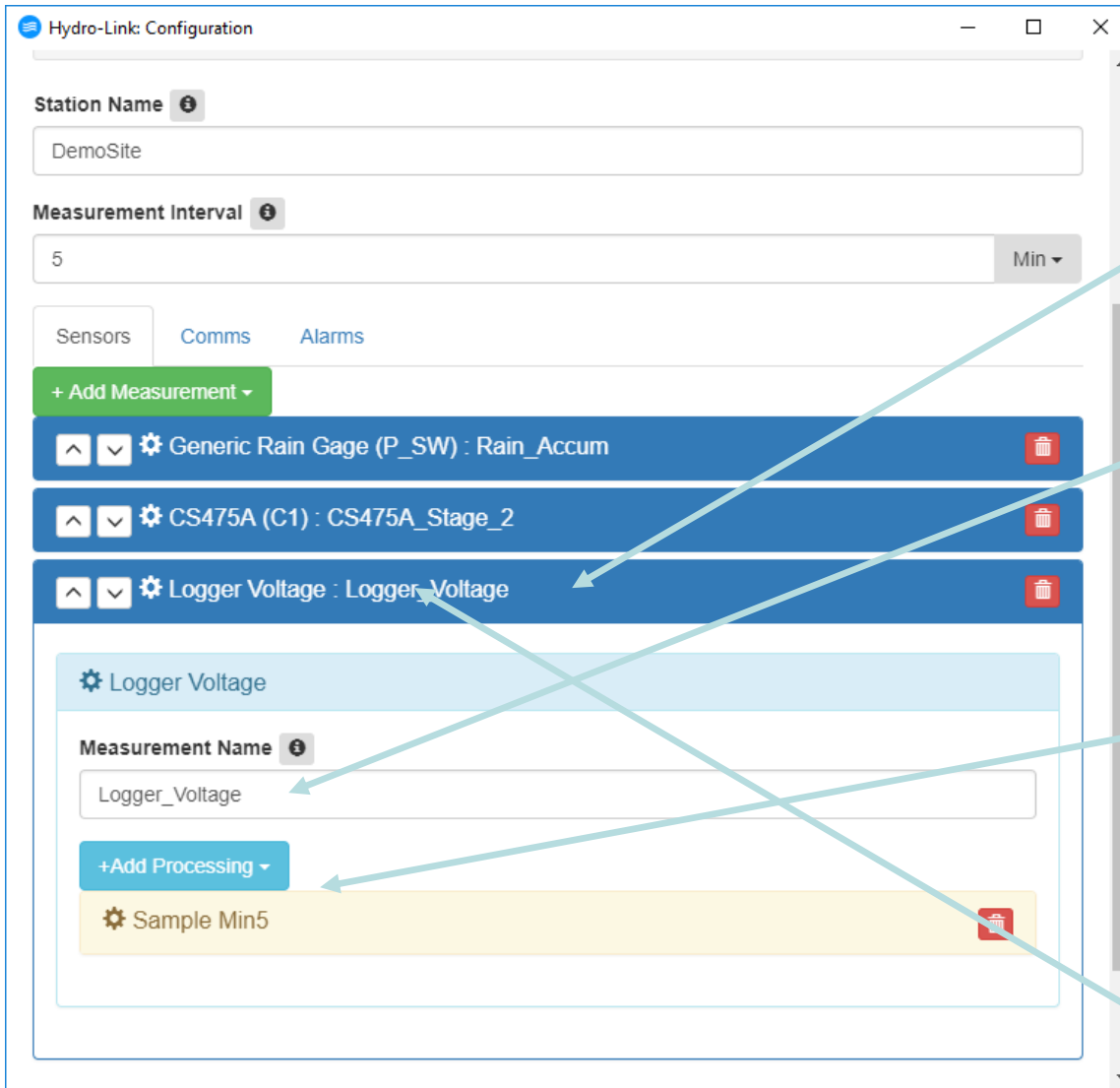
CS475A (C1) : CS475A_Stage_2

Now with the rain and water level sensor dialog boxes minimized, add in the system battery voltage. This is often recorded for diagnostic reasons

Select **Add Measurement**, **Internal**, and then **Logger Voltage**

Rain and water level shown here but minimized

Configuration - 12



The screenshot shows the 'Hydro-Link: Configuration' window. At the top, there are fields for 'Station Name' (DemoSite) and 'Measurement Interval' (5). Below these are tabs for 'Sensors', 'Comms', and 'Alarms'. A green '+ Add Measurement' button is visible. Three measurement entries are listed: 'Generic Rain Gage (P_SW) : Rain_Accum', 'CS475A (C1) : CS475A_Stage_2', and 'Logger Voltage : Logger_Voltage'. The 'Logger Voltage' entry is expanded, showing a 'Measurement Name' field with 'Logger_Voltage', a '+Add Processing' button, and a 'Sample Min5' processing option. A title bar at the top of the window contains a minimize button.

The Logger Voltage measurement is added after the rain and water level measurements

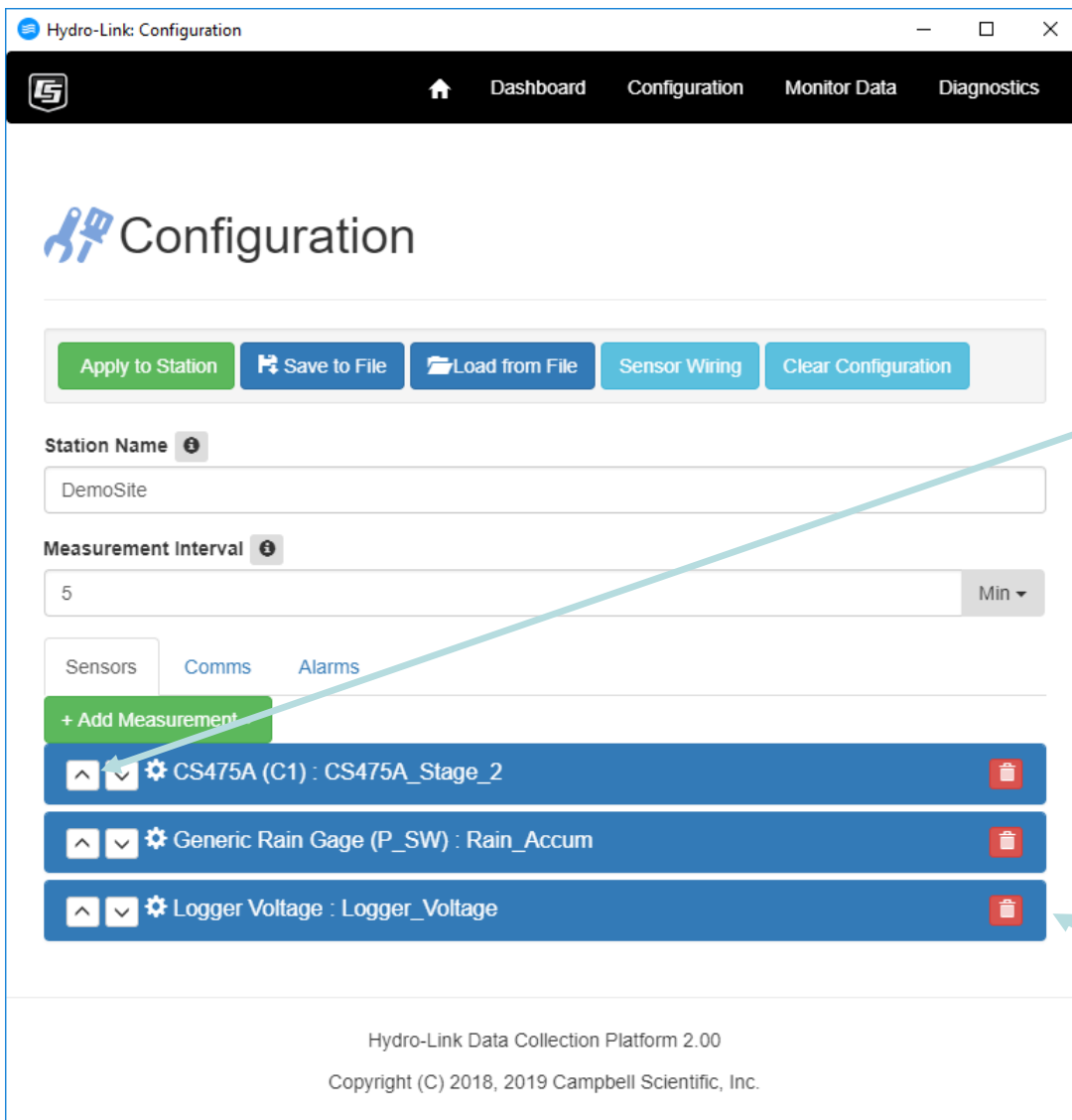
If desired, change the default name for the data value

The default processing will be used

The Add Processing options are used to get averages, max and min values etc. if needed

Click the **title bar** to minimize this window

Configuration - 13



The screenshot shows the 'Hydro-Link: Configuration' window. At the top, there is a navigation bar with 'Dashboard', 'Configuration', 'Monitor Data', and 'Diagnostics'. Below this is a 'Configuration' section with a toolbar containing 'Apply to Station', 'Save to File', 'Load from File', 'Sensor Wiring', and 'Clear Configuration'. The 'Station Name' is set to 'DemoSite' and the 'Measurement Interval' is set to '5'. There are three tabs: 'Sensors', 'Comms', and 'Alarms'. Under the 'Sensors' tab, there is a '+ Add Measurement' button and a list of three sensors:

- CS475A (C1) : CS475A_Stage_2
- Generic Rain Gage (P_SW) : Rain_Accum
- Logger Voltage : Logger_Voltage

Each sensor entry has an up/down arrow, a settings gear icon, and a red trash can icon for deletion. The sensors are listed in the order: CS475A, Rain Gage, and Logger Voltage.

Hydro-Link Data Collection Platform 2.00
Copyright (C) 2018, 2019 Campbell Scientific, Inc.

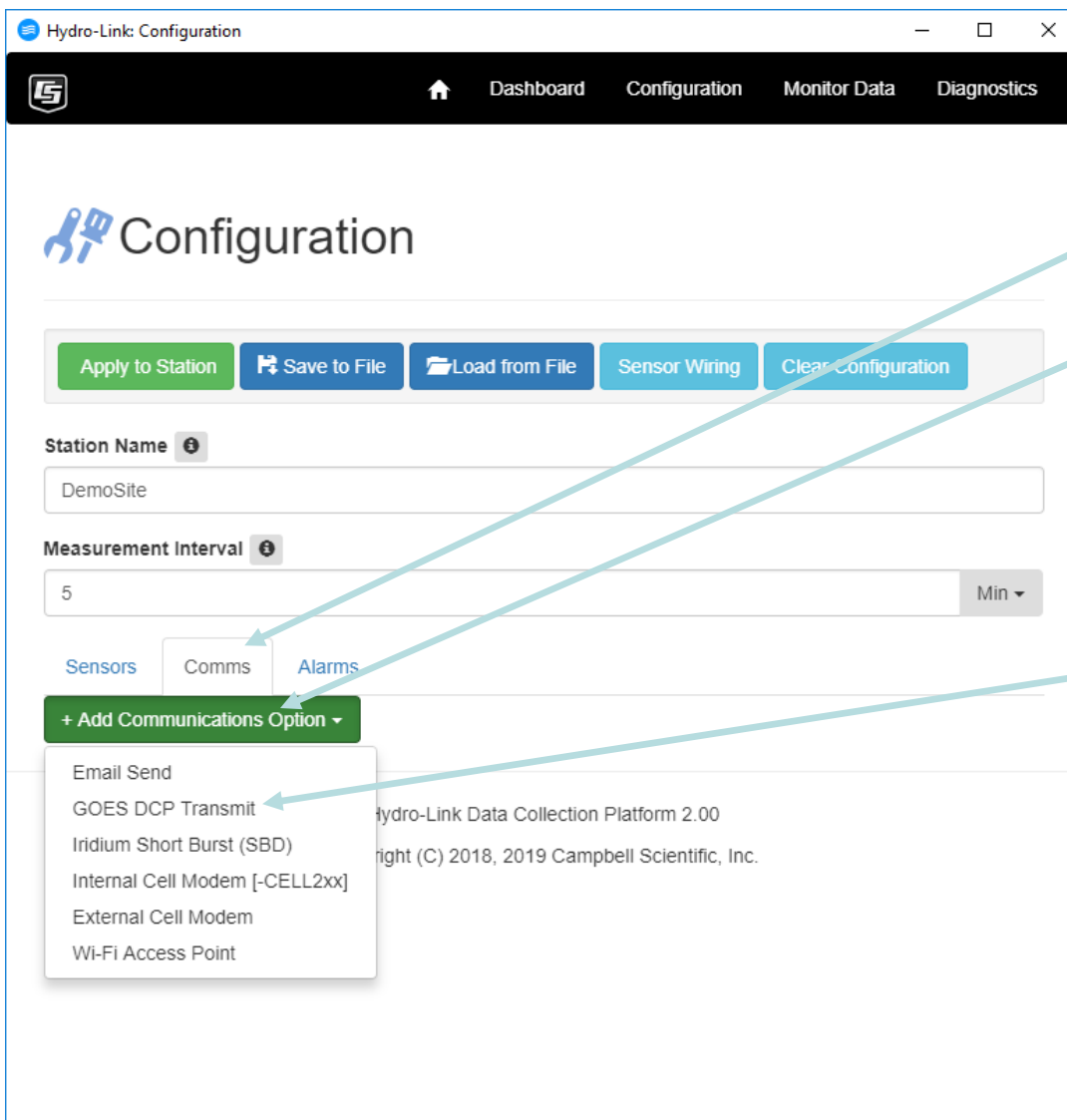
Here is the configuration window with the three sensors shown

Notice that the water level sensor is now listed before the rain gauge. The **arrow keys** were used to rearrange the order of the measurements as desired. Normally primary data is listed first

More measurements can be added if needed

Measurements can be deleted by clicking on the **garbage can**

Configuration - 14



Hydro-Link: Configuration

Dashboard Configuration Monitor Data Diagnostics

Configuration

Apply to Station Save to File Load from File Sensor Wiring Clear Configuration

Station Name ?
DemoSite

Measurement Interval ?
5 Min

Sensors Comms Alarms

+ Add Communications Option

- Email Send
- GOES DCP Transmit
- Iridium Short Burst (SBD)
- Internal Cell Modem [-CELL2xx]
- External Cell Modem
- Wi-Fi Access Point

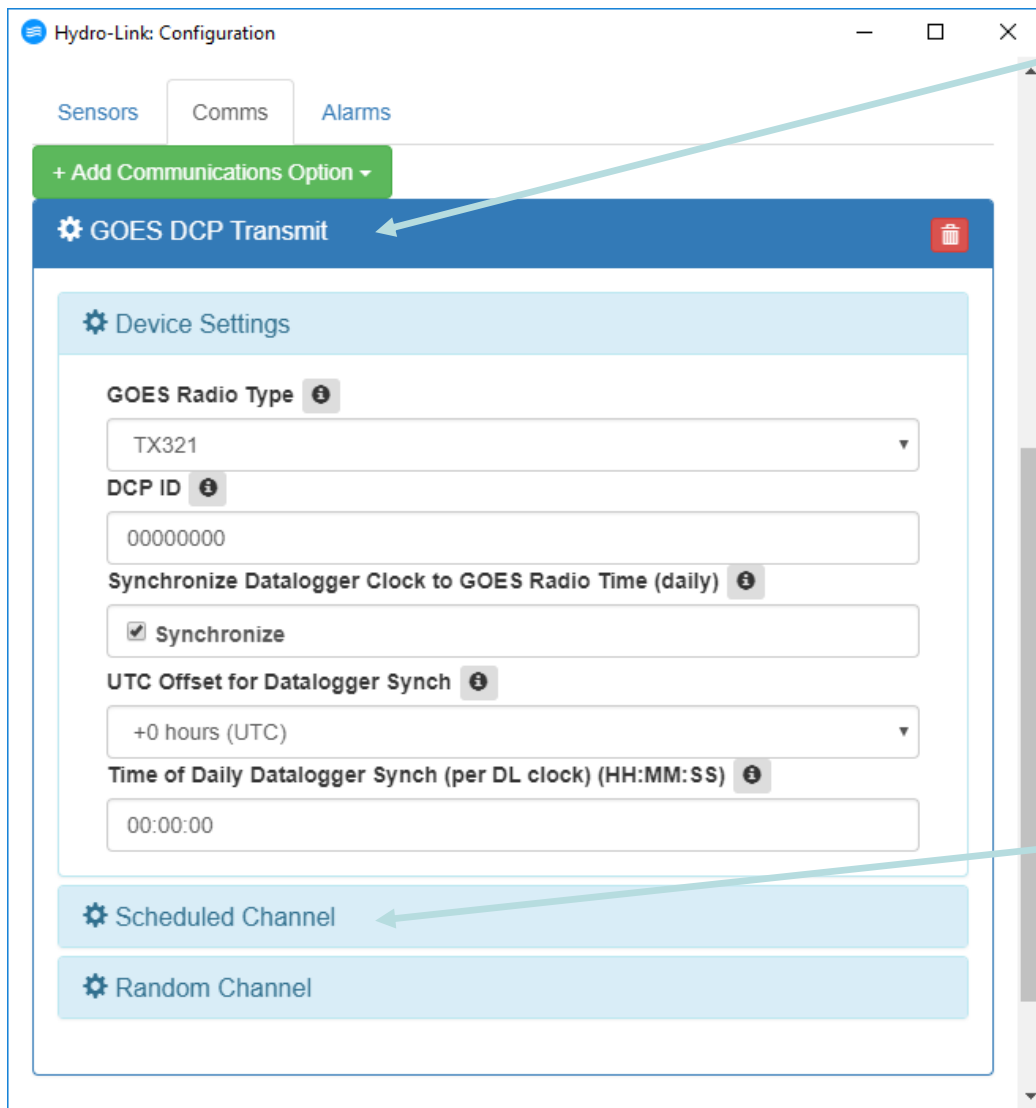
Hydro-Link Data Collection Platform 2.00
Copyright (C) 2018, 2019 Campbell Scientific, Inc.

Now communication options can be configured

Select the **Comms** tab and then **Add Communications Option** button to see the options

Several different communication options are available, for this demo the **GOES DCP** option will be used. Click on this option

Configuration - 15



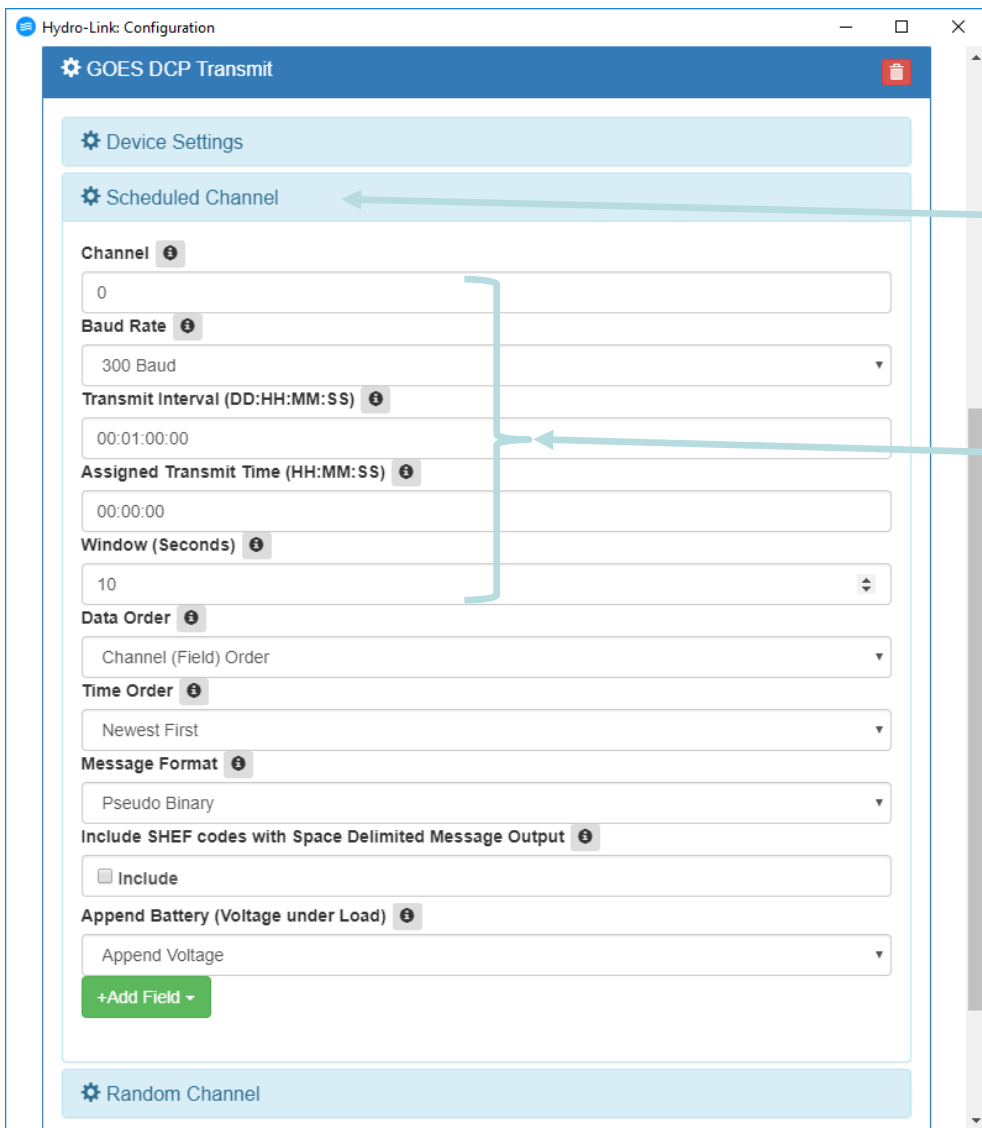
The screenshot shows the 'Hydro-Link: Configuration' window with three tabs: 'Sensors', 'Comms', and 'Alarms'. A green button labeled '+ Add Communications Option' is visible. Below it, a blue header bar for 'GOES DCP Transmit' is highlighted with a light blue arrow. The main content area is titled 'Device Settings' and contains several configuration fields: 'GOES Radio Type' (dropdown menu with 'TX321' selected), 'DCP ID' (text input with '00000000'), 'Synchronize Datalogger Clock to GOES Radio Time (daily)' (checkbox labeled 'Synchronize' which is checked), 'UTC Offset for Datalogger Synch' (dropdown menu with '+0 hours (UTC)' selected), and 'Time of Daily Datalogger Synch (per DL clock) (HH:MM:SS)' (text input with '00:00:00'). At the bottom of the dialog, there are two light blue buttons: 'Scheduled Channel' and 'Random Channel'. A light blue arrow points to the 'Scheduled Channel' button.

Clicking on the title bar will open the **GOES DCP**, Device Settings dialog box and show the title bars for the scheduled or self timed options and random options

The options here are general radio options, make the selections as needed. Some options for the DCP setup are assigned by NESDIS

Once options for the general setup have been made click on the title bar for the **Scheduled Channel** to open this dialog box

Configuration - 16



The screenshot shows the 'Hydro-Link: Configuration' window with the 'GOES DCP Transmit' title bar. The 'Scheduled Channel' section is active, displaying various configuration options. A blue arrow points to the 'Scheduled Channel' title bar, and another blue arrow points to the 'Transmit Interval' field. A bracket on the right side of the 'Channel', 'Baud Rate', 'Transmit Interval', and 'Assigned Transmit Time' fields indicates that these values are assigned by NESDIS.

Field	Value
Channel	0
Baud Rate	300 Baud
Transmit Interval (DD:HH:MM:SS)	00:01:00:00
Assigned Transmit Time (HH:MM:SS)	00:00:00
Window (Seconds)	10
Data Order	Channel (Field) Order
Time Order	Newest First
Message Format	Pseudo Binary
Include SHEF codes with Space Delimited Message Output	<input type="checkbox"/> Include
Append Battery (Voltage under Load)	Append Voltage

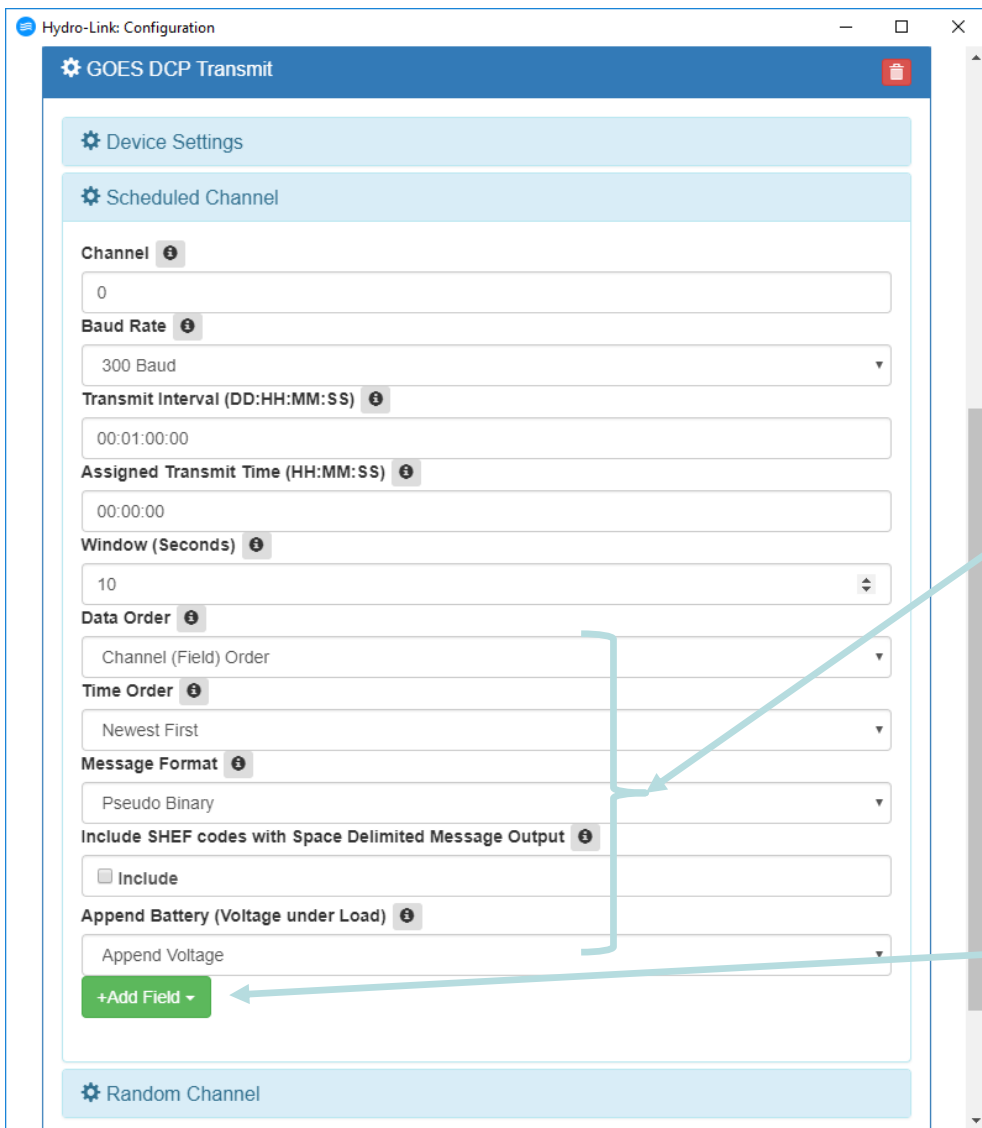
Clicking on the Device Settings title bar to minimize it.

Then click on the **Scheduled Channel** title bar to open that dialog box

Many options here are assigned by **NESDIS**, enter in the assigned values.

NOTE: Leaving these options at the default setting will cause the datalogger to leave the GOES radio disabled.

Configuration - 17



Hydro-Link: Configuration

GOES DCP Transmit

Device Settings

Scheduled Channel

Channel ⓘ

0

Baud Rate ⓘ

300 Baud

Transmit Interval (DD:HH:MM:SS) ⓘ

00:01:00:00

Assigned Transmit Time (HH:MM:SS) ⓘ

00:00:00

Window (Seconds) ⓘ

10

Data Order ⓘ

Channel (Field) Order

Time Order ⓘ

Newest First

Message Format ⓘ

Pseudo Binary

Include SHEF codes with Space Delimited Message Output ⓘ

Include

Append Battery (Voltage under Load) ⓘ

Append Voltage

+Add Field ▾

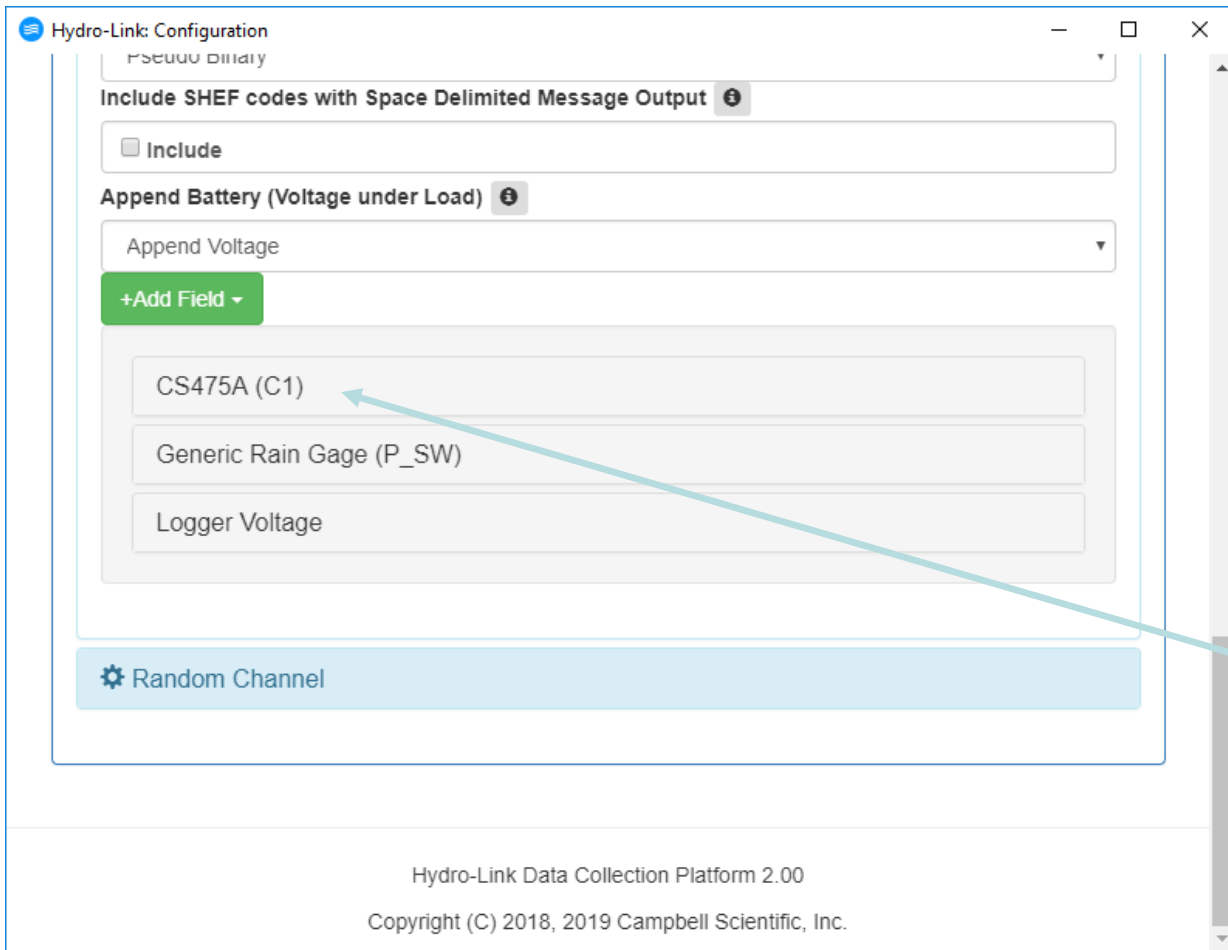
Random Channel

Other options on the **Scheduled Channel** page indicate how the data will be transmitted

These options indicate if the data should be transmitted in an ASCII or Pseudo Binary format, if the SHEF codes should be included in the transmission, what order the data will be transmitted, if a loaded battery reading is to be sent, etc.

Once these options have been selected, use the **Add Field** option to indicate what data to transmit

Configuration - 18



Hydro-Link: Configuration

Include SHEF codes with Space Delimited Message Output ⓘ

Include

Append Battery (Voltage under Load) ⓘ

Append Voltage

+Add Field ▾

CS475A (C1)

Generic Rain Gage (P_SW)

Logger Voltage

⚙ Random Channel

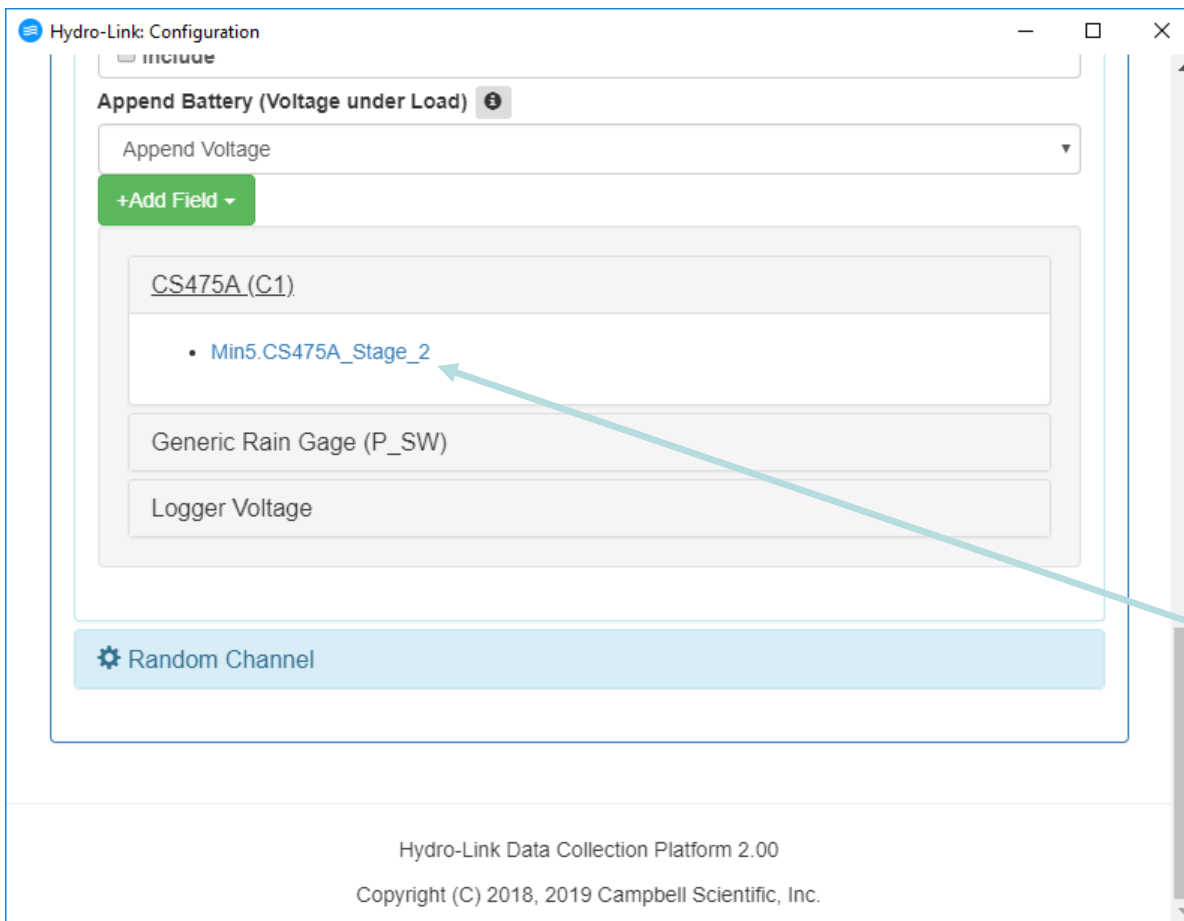
Hydro-Link Data Collection Platform 2.00
Copyright (C) 2018, 2019 Campbell Scientific, Inc.

Notice once the **Add Field** button is clicked, the three measurements included earlier are listed.

Note the data logged does not have to be transmitted.

Click on the **CS475A Radar** to set it up to be transmitted

Configuration – 19



Hydro-Link: Configuration

include

Append Battery (Voltage under Load) ⓘ

Append Voltage

+Add Field ▾

CS475A (C1)

- [Min5.CS475A_Stage_2](#)

Generic Rain Gage (P_SW)

Logger Voltage

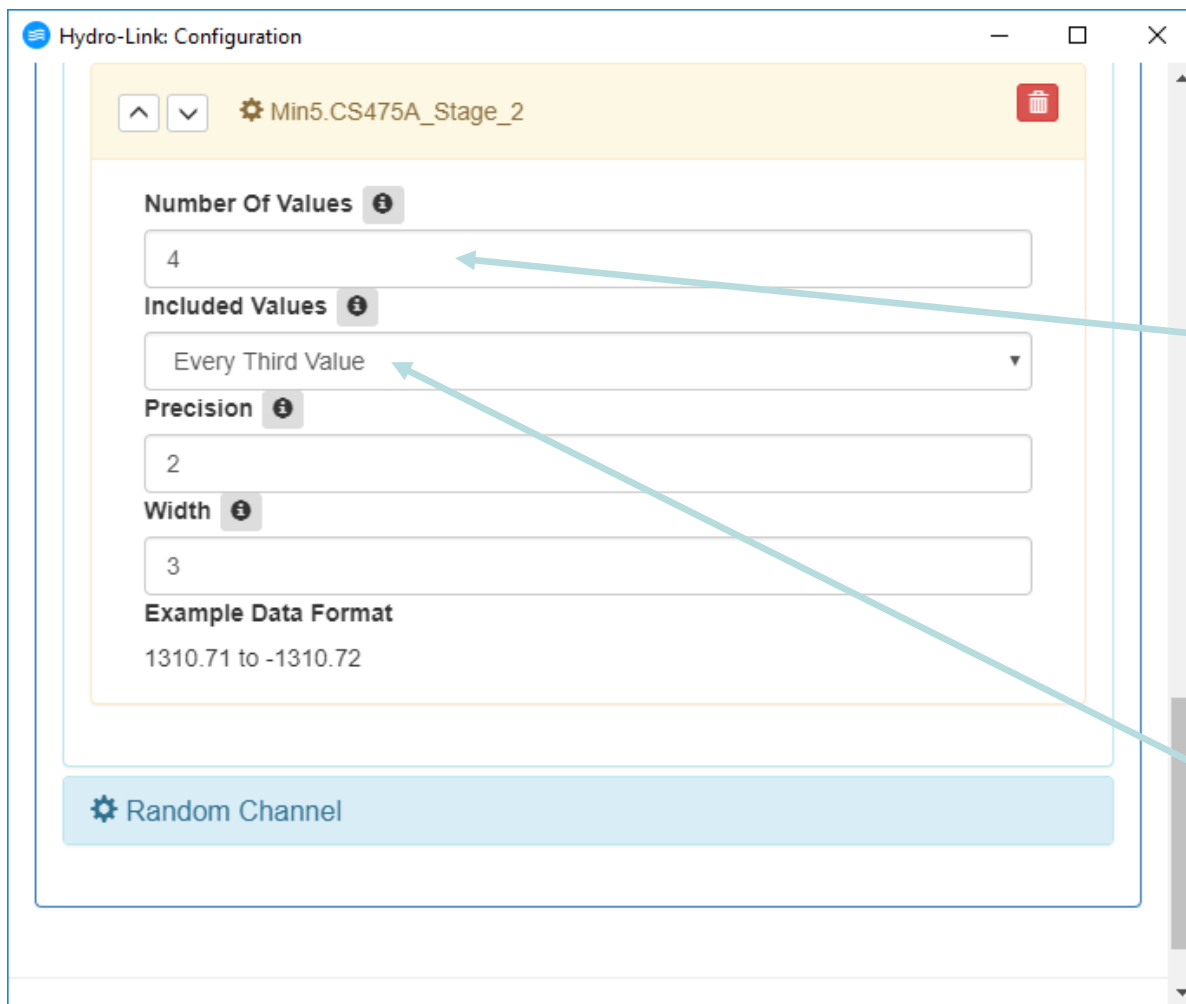
⚙ Random Channel

Hydro-Link Data Collection Platform 2.00
Copyright (C) 2018, 2019 Campbell Scientific, Inc.

After clicking on the **CS474A**, the options from the measurement setup for that sensor are listed. Here only the **sample** water level (Stage) value is listed as we did not include any averaging or max, min processes

Click the **Min5.CS475A_Stage** link to open the dialog box for that measurement

Configuration – 20



Hydro-Link: Configuration

Min5.CS475A_Stage_2

Number Of Values ⓘ

4

Included Values ⓘ

Every Third Value ▼

Precision ⓘ

2

Width ⓘ

3

Example Data Format

1310.71 to -1310.72

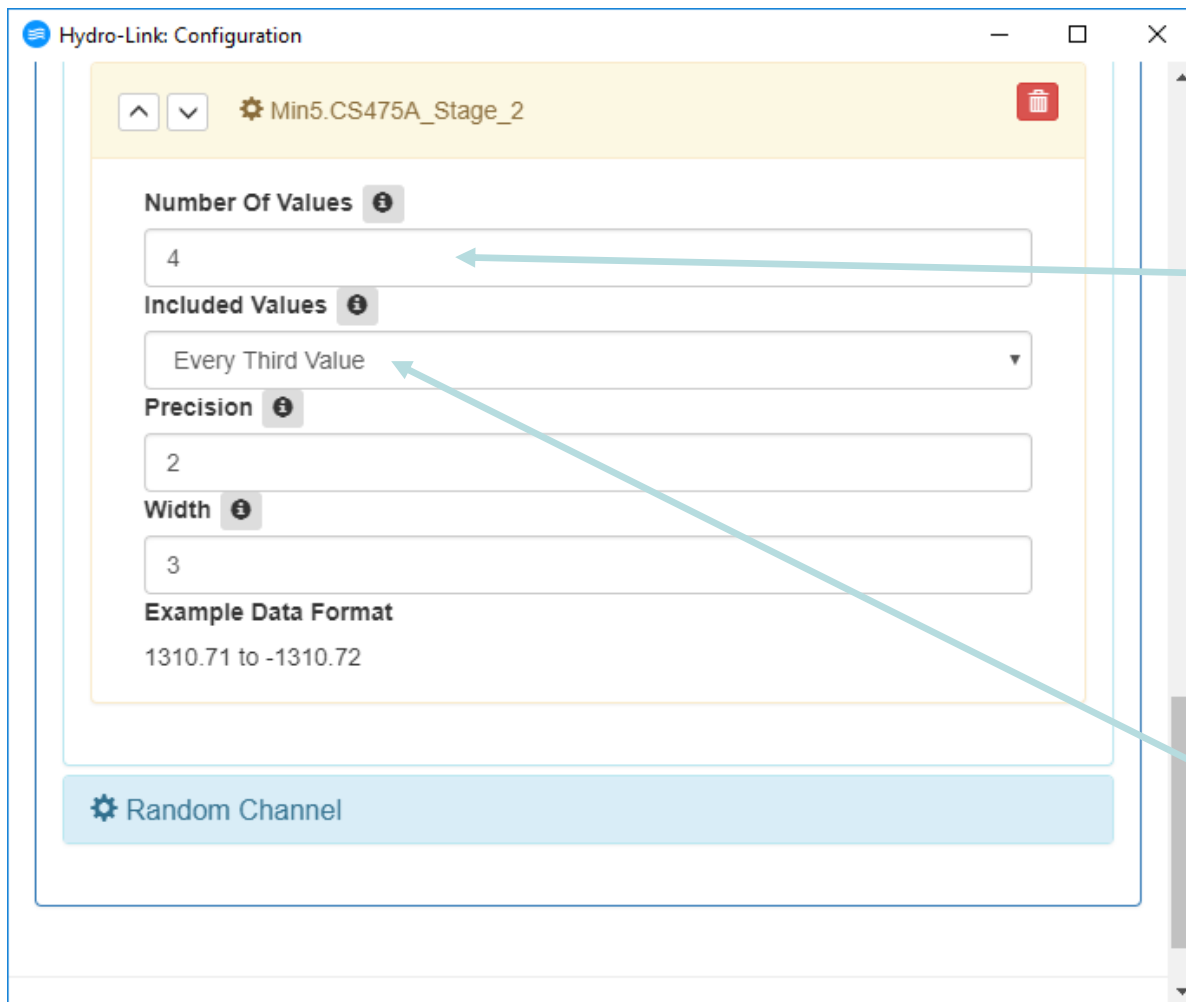
Random Channel

Options here are used to set the transmit parameter for this single measurement

For this example, the **Number of Values**, option indicates how many values of the water level measurement will be sent each transmission

The Number of Values option is used in conjunction with the **Include Values** option

Configuration – 21



Hydro-Link: Configuration

Min5.CS475A_Stage_2

Number Of Values ⓘ

4

Included Values ⓘ

Every Third Value

Precision ⓘ

2

Width ⓘ

3

Example Data Format

1310.71 to -1310.72

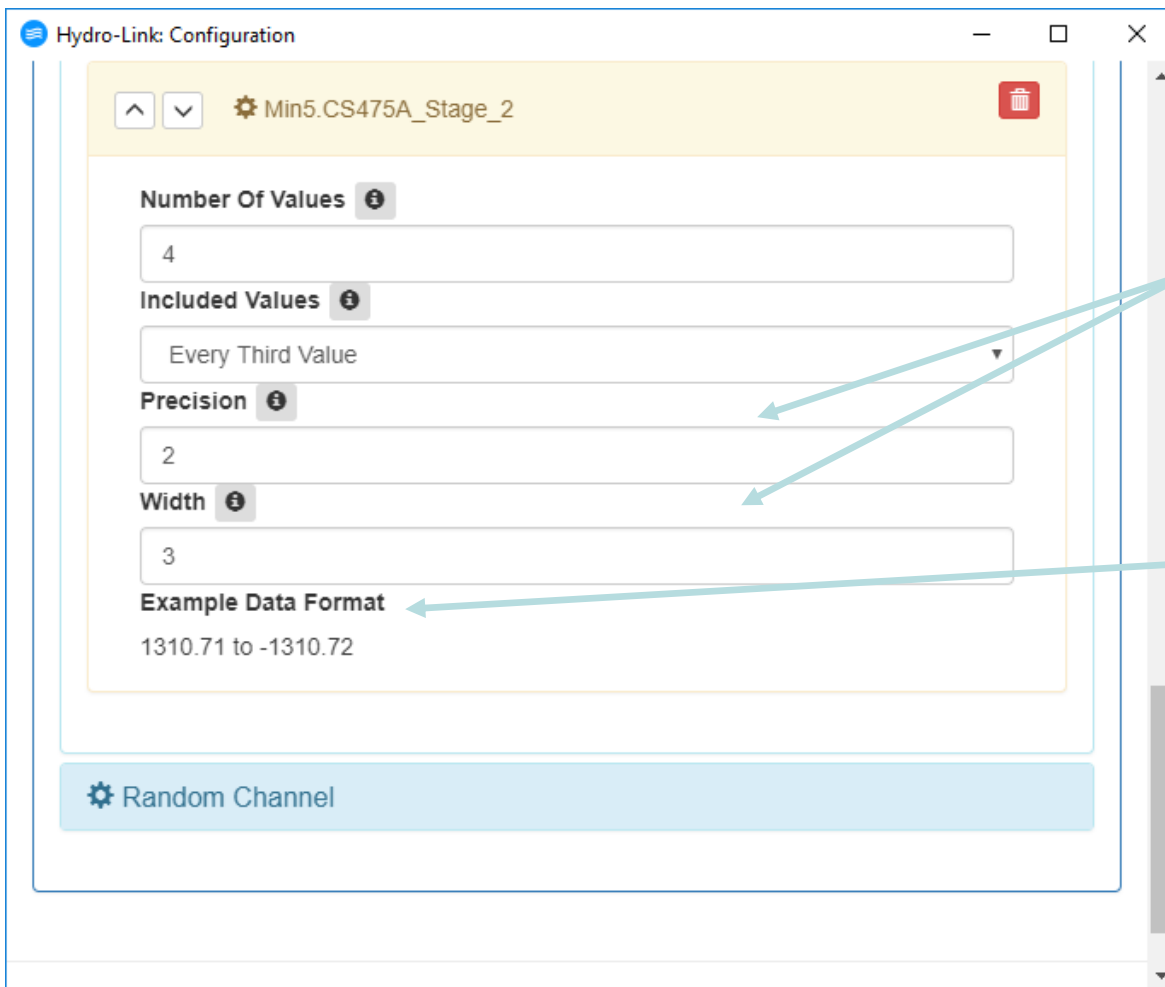
Random Channel

Since the unit is set to log data every 5 minutes, setting the **Include Values** option to “Every Third Value” tells the system to transmit 15 minute data.

With the **Number of values** option set to 4, then one hour of data will be transmitted for this measurement

Setting the **Number Of Values** option to 8 would send one set of redundant data, which is a common practice

Configuration – 22



Hydro-Link: Configuration

Min5.CS475A_Stage_2

Number Of Values ⓘ
4

Included Values ⓘ
Every Third Value

Precision ⓘ
2

Width ⓘ
3

Example Data Format
1310.71 to -1310.72

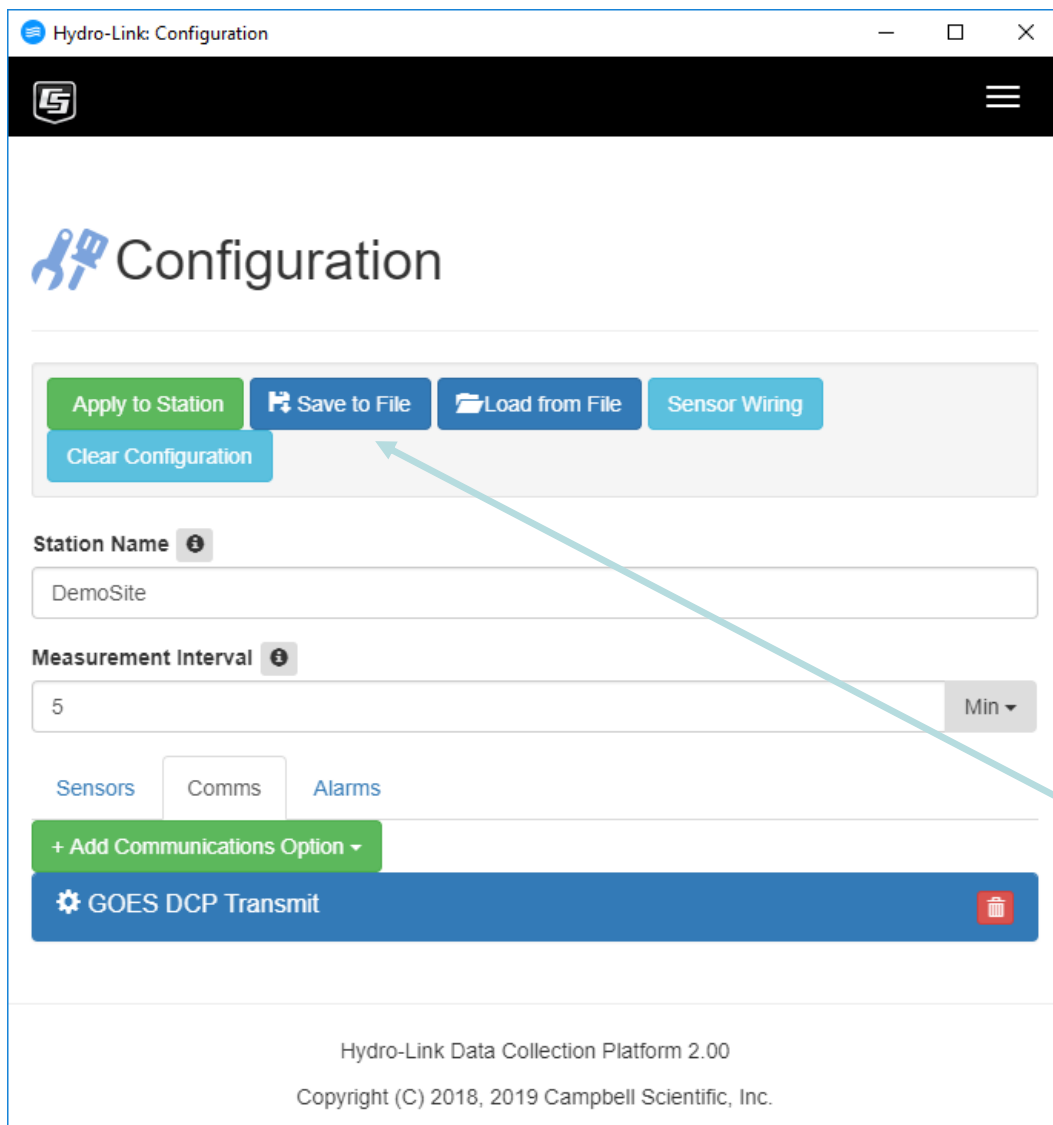
Random Channel

The **Precision** and **Width** options are used for both the Pseudo Binary for the ASCII format. They define how many characters are used for each value

It is sometimes hard to remember how different settings affect the data range, the example format is a helpful reminder

The rain gauge is added the same way. The batt value is normally added as an appended value

Configuration - 23




Hydro-Link: Configuration


Configuration

Apply to Station Save to File Load from File Sensor Wiring

Clear Configuration

Station Name 


DemoSite

Measurement Interval 

5 Min

Sensors Comms Alarms

+ Add Communications Option

GOES DCP Transmit 

Hydro-Link Data Collection Platform 2.00

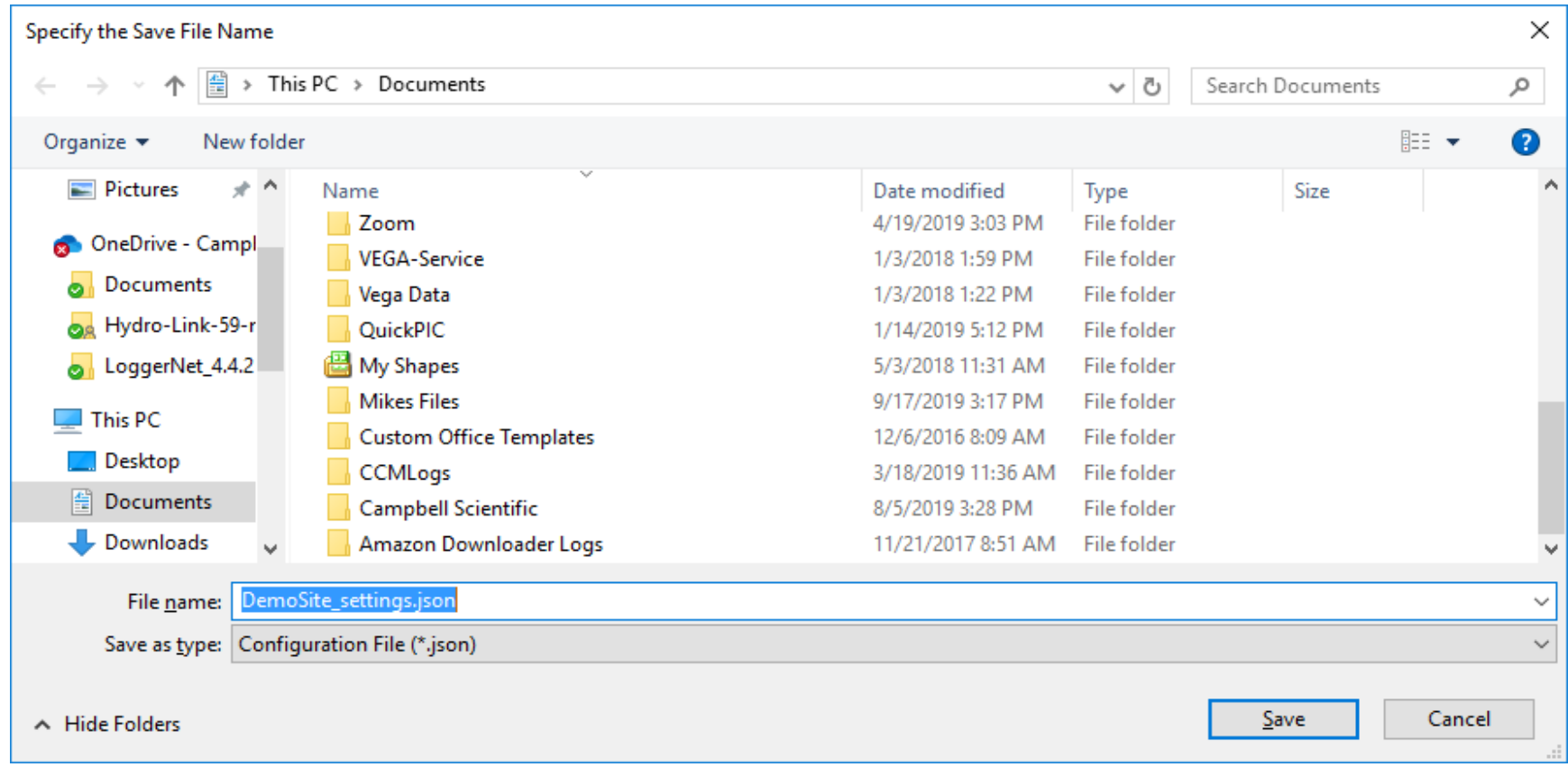
Copyright (C) 2018, 2019 Campbell Scientific, Inc.

Here is the configuration window with all the options minimized and the Comms tab selected. Notice it shows the header for the GOES DCP indicating it is being used

No alarms will be setup for this demonstration, Alarms are used to control digital outputs or make special communication transmissions

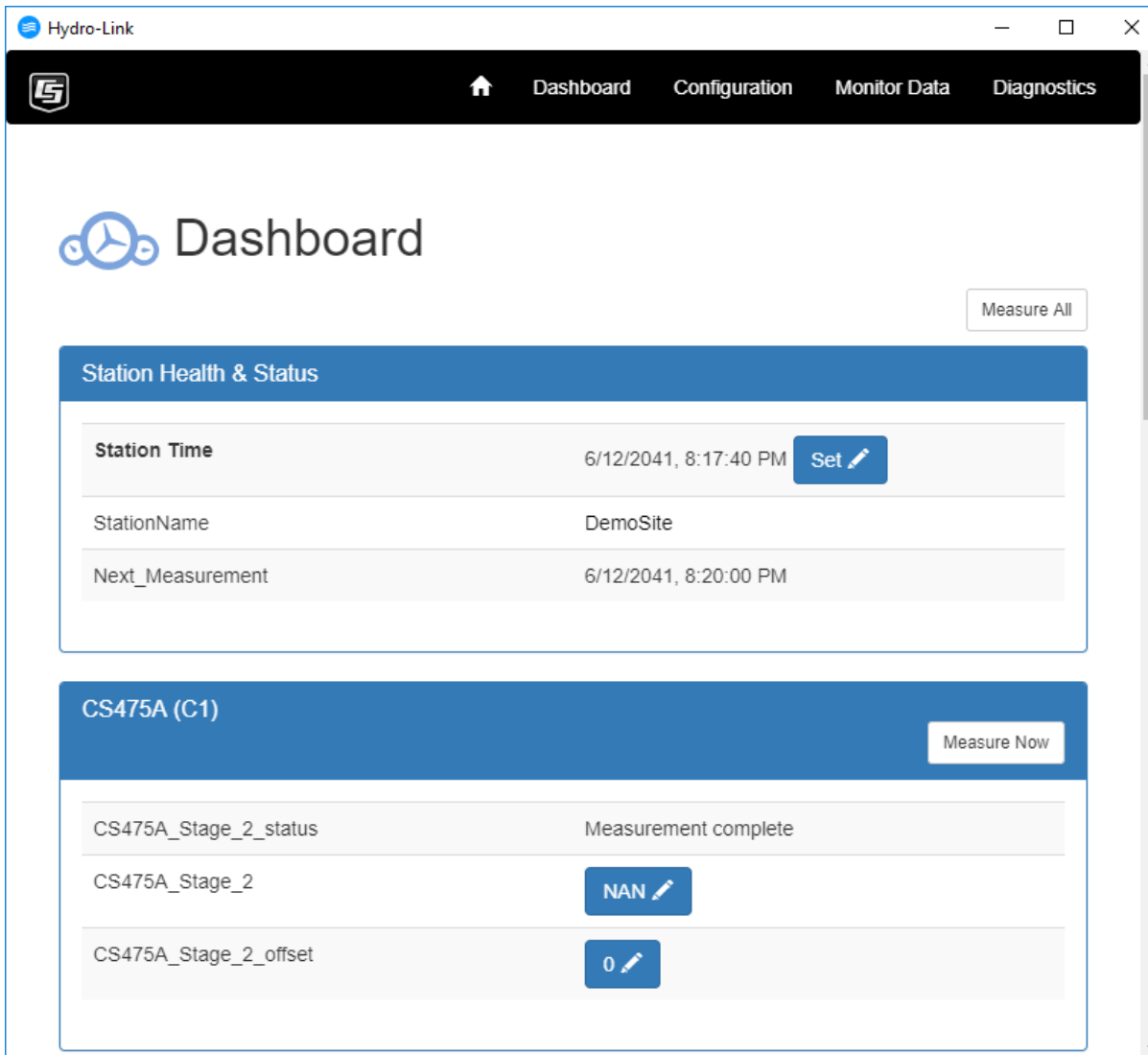
This is a good time to **save** the configuration to the computers hard drive or to send it to the datalogger

Configuration - 24



When saving the configuration file, standard windows dialog boxes or file download tools are used. It is always suggested to save the configuration files for later use

Dashboard - 1



The screenshot shows the Hydro-Link web application interface. At the top, there is a navigation bar with a home icon, 'Dashboard', 'Configuration', 'Monitor Data', and 'Diagnostics'. Below the navigation bar, the main content area features a 'Dashboard' heading with a clock icon and a 'Measure All' button. The dashboard is divided into two main sections: 'Station Health & Status' and 'CS475A (C1)'. The 'Station Health & Status' section displays a table with the following data:

Station Health & Status	
Station Time	6/12/2041, 8:17:40 PM Set
StationName	DemoSite
Next_Measurement	6/12/2041, 8:20:00 PM

The 'CS475A (C1)' section displays a table with the following data:

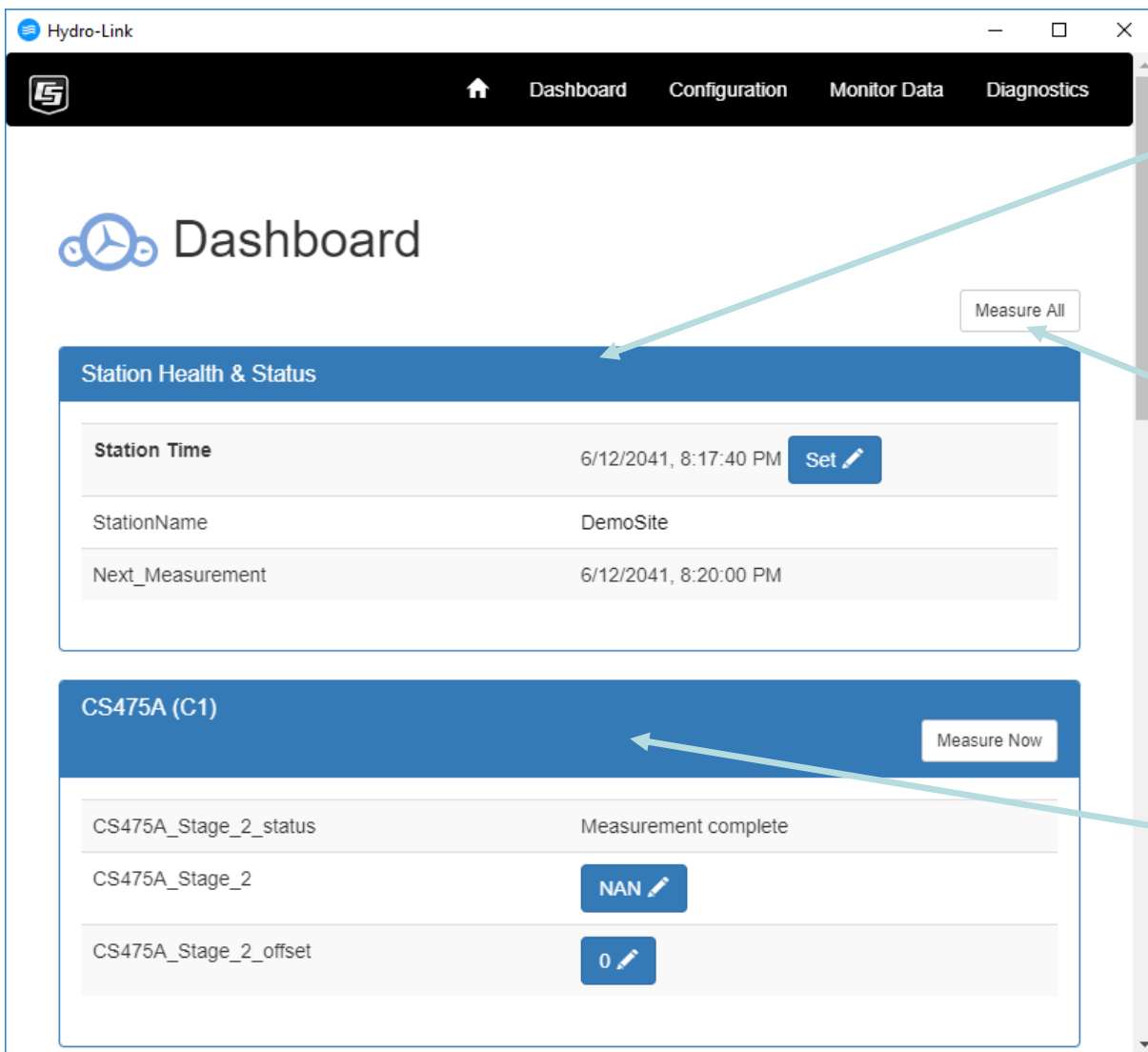
CS475A (C1)	
CS475A_Stage_2_status	Measurement complete
CS475A_Stage_2	NAN
CS475A_Stage_2_offset	0

The **dashboard** will be one of the most used functions of Hydro-Link

Normally the datalogger is configured one time and then once in service the dashboard is used every site visit to verify operation. That is why the dashboard is the main landing page once connected

The dashboard is built based on the options selected in the configuration process

Dashboard - 2



Hydro-Link

Dashboard Configuration Monitor Data Diagnostics

Dashboard

Measure All

Station Health & Status

Station Time	6/12/2041, 8:17:40 PM	Set
StationName	DemoSite	
Next_Measurement	6/12/2041, 8:20:00 PM	

CS475A (C1)

Measure Now

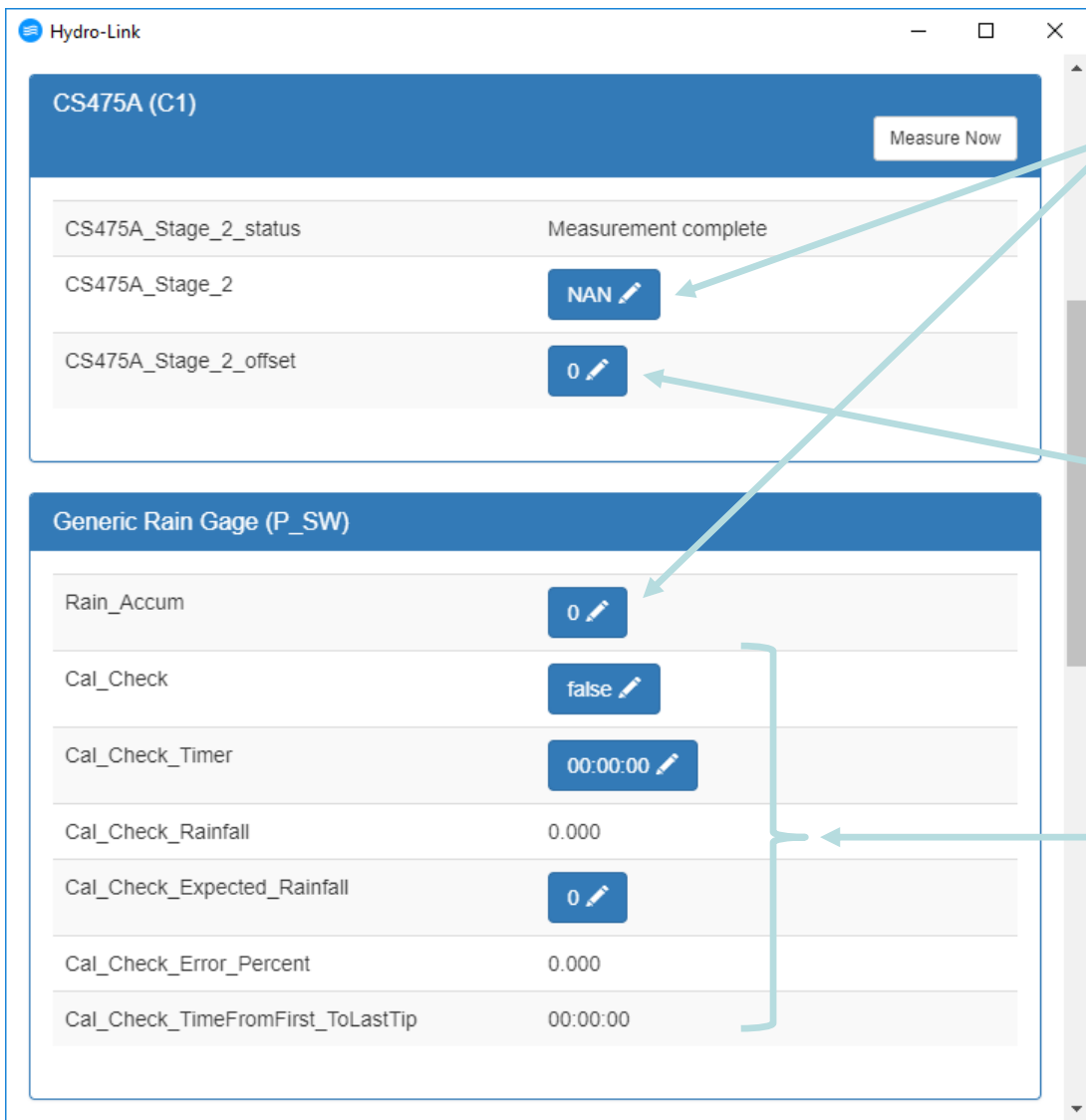
CS475A_Stage_2_status	Measurement complete	
CS475A_Stage_2	NAN	
CS475A_Stage_2_offset	0	

The **Station Health & Status** panel will always be on the top of the dashboard. It lists general information of the site

The **Measure All** button allows an easy way to measure all the sensors immediately, independent of the scan rate.

The first sensor configured for this demo was the CS475A radar for water level or stage, it will be the next panel on the dashboard

Dashboard - 3






Hydro-Link

CS475A (C1) Measure Now

CS475A_Stage_2_status	Measurement complete
CS475A_Stage_2	NAN 
CS475A_Stage_2_offset	0 

Generic Rain Gage (P_SW)

Rain_Accum	0 
Cal_Check	false 
Cal_Check_Timer	00:00:00 
Cal_Check_Rainfall	0.000
Cal_Check_Expected_Rainfall	0 
Cal_Check_Error_Percent	0.000
Cal_Check_TimeFromFirst_ToLastTip	00:00:00

Normally for each sensor panel, the last measured value for that sensor will be displayed near the top of the panel.

There are options on the dashboard that are better set during runtime rather than during initial configuration, an offset value for example

The rain gauge panel has several options on the dashboard used to test the calibration of the rain gauge. These are run time actions, not needed when configuring the DCP

Dashboard - 4

Hydro-Link
— □ ×

GOES DCP Transmit

FailSafe_Status	OK
Radio_Time	0-00-00 19:38:05 UTC
Sched_Buffer	
Next_SchedTx	00:00:24:15
Request_RandomTx_AfterMeas	false
Sched_Error	ACK or OK not returned.

GOES Clock Synchronization

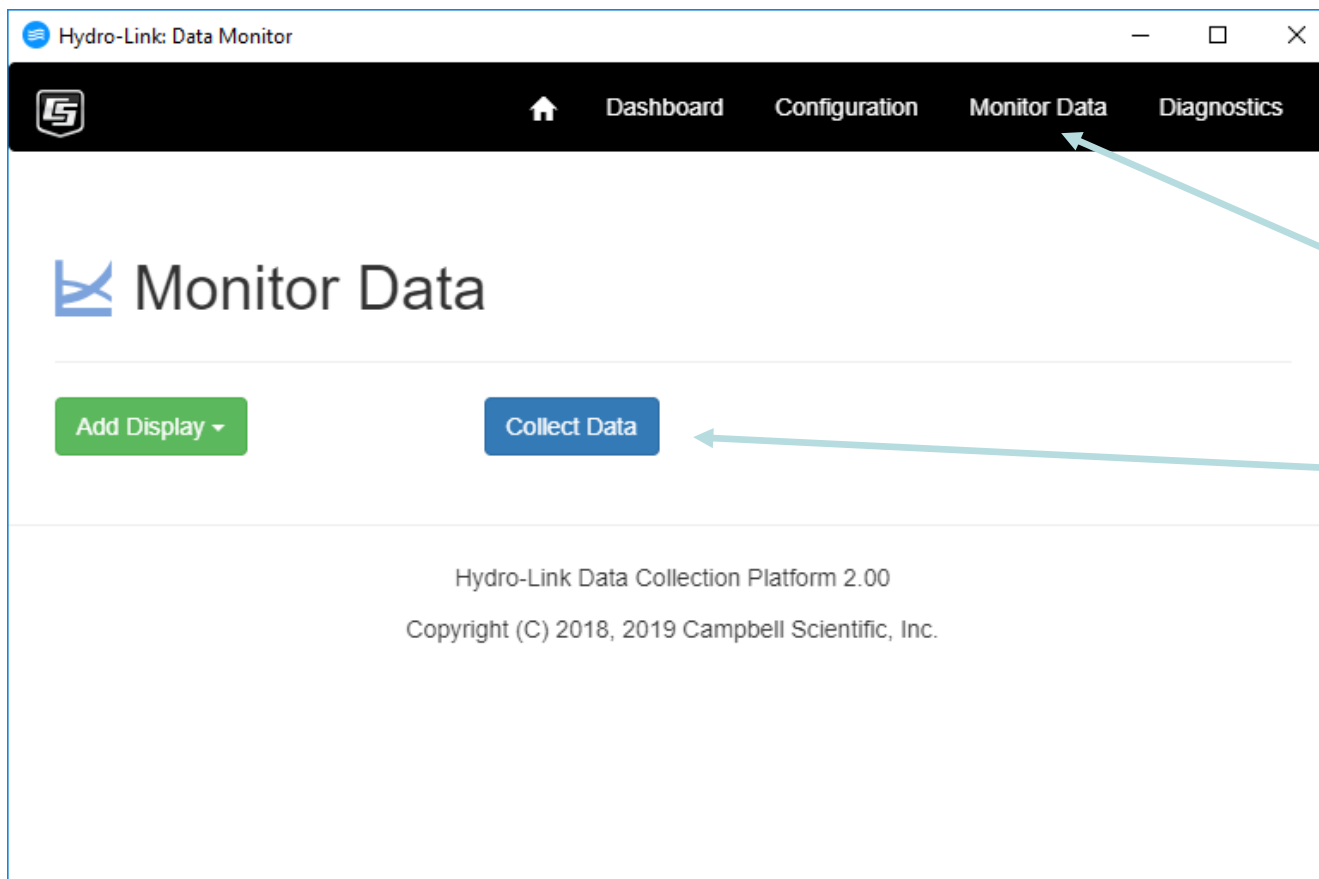
Last_Radio_GPS_Synch	
Last_DL_RadioClock_Synch	0-00-00 02:48:41
Synch_DL_To_RadioClock	false

The GOES radio was configured under the Comms options, Since it was included in the configuration, it will have a panel on the dashboard also.

General radio status will be displayed on the dashboard

When setting the GOES radio options, the option to sync the datalogger clock to the accurate GOES clock was also set. This panel lists information on the sync process

Data Monitor - 1



Hydro-Link: Data Monitor

Dashboard Configuration Monitor Data Diagnostics

Monitor Data

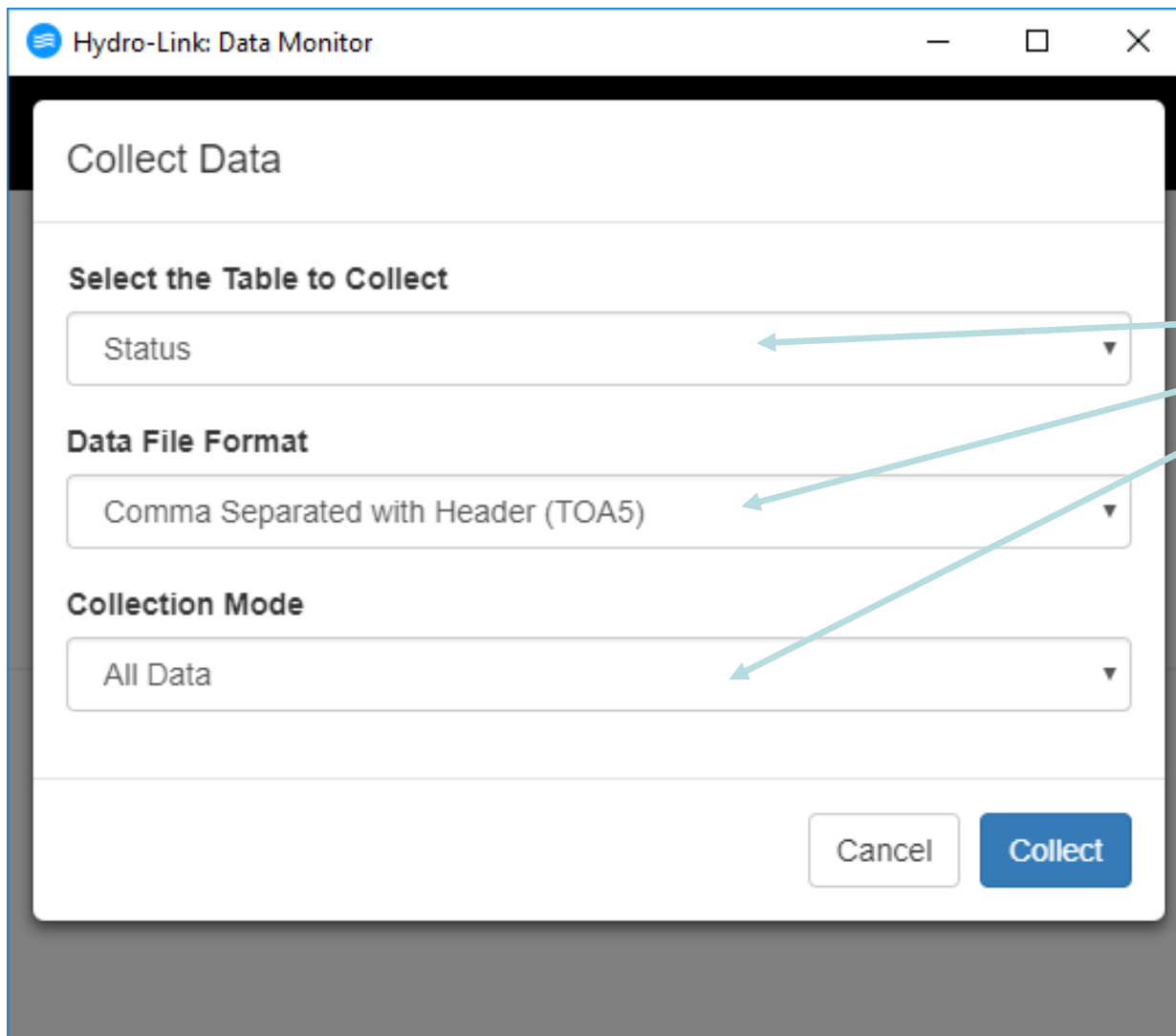
Add Display ▾ Collect Data

Hydro-Link Data Collection Platform 2.00
Copyright (C) 2018, 2019 Campbell Scientific, Inc.

The **Data Monitor** tab is used to create graphs or tables to display the data,

The one option that will be used most often will be the **Collect Data** Option

Data Monitor - 2



Hydro-Link: Data Monitor

Collect Data

Select the Table to Collect

Status

Data File Format

Comma Separated with Header (TOA5)

Collection Mode

All Data

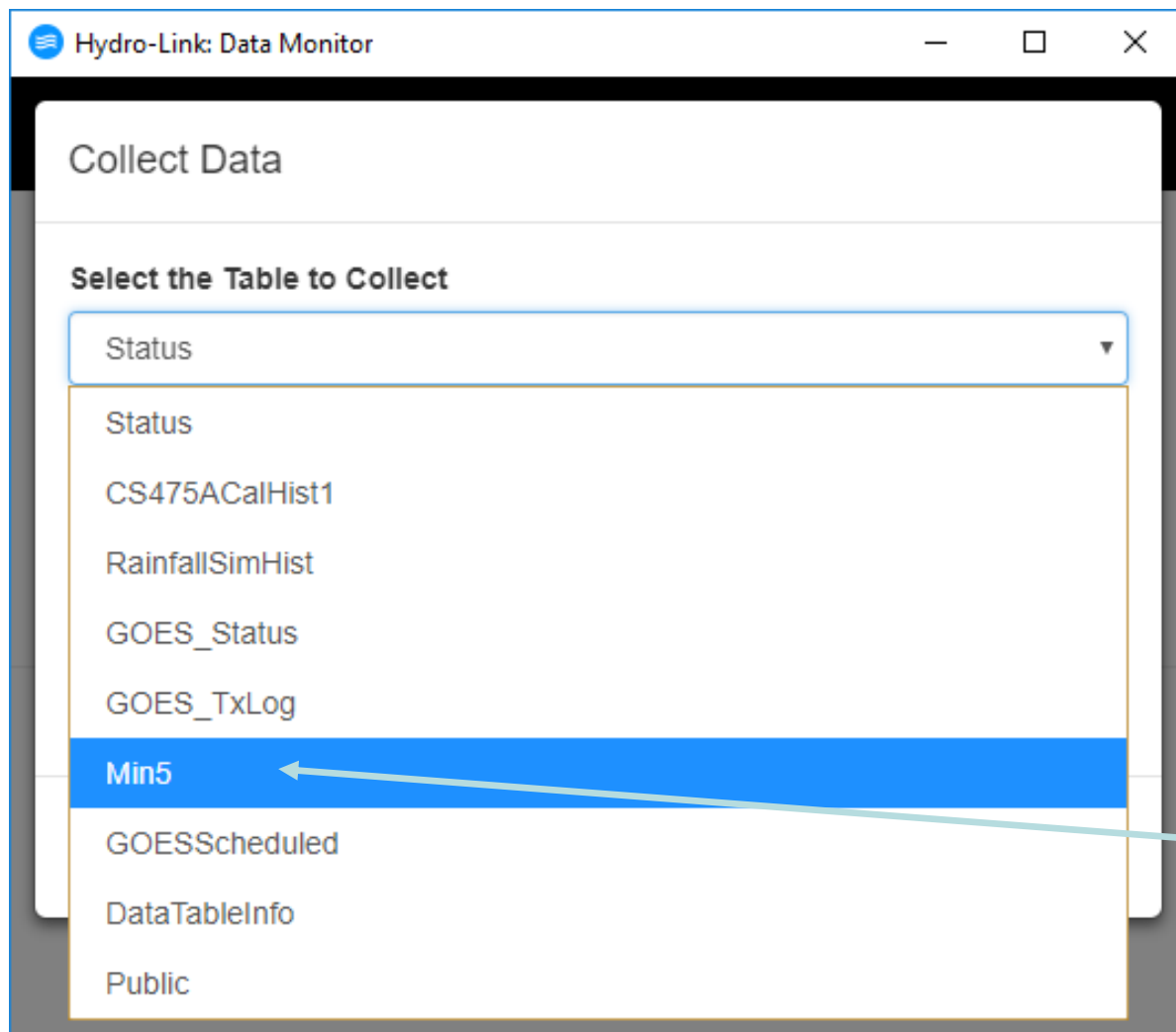
Cancel Collect

After clicking the **Collect Data** button, options are displayed to:

- Select a data table
- Select a file format
- Select a collect mode

Normally the default settings for the file format and the collection mode are the best

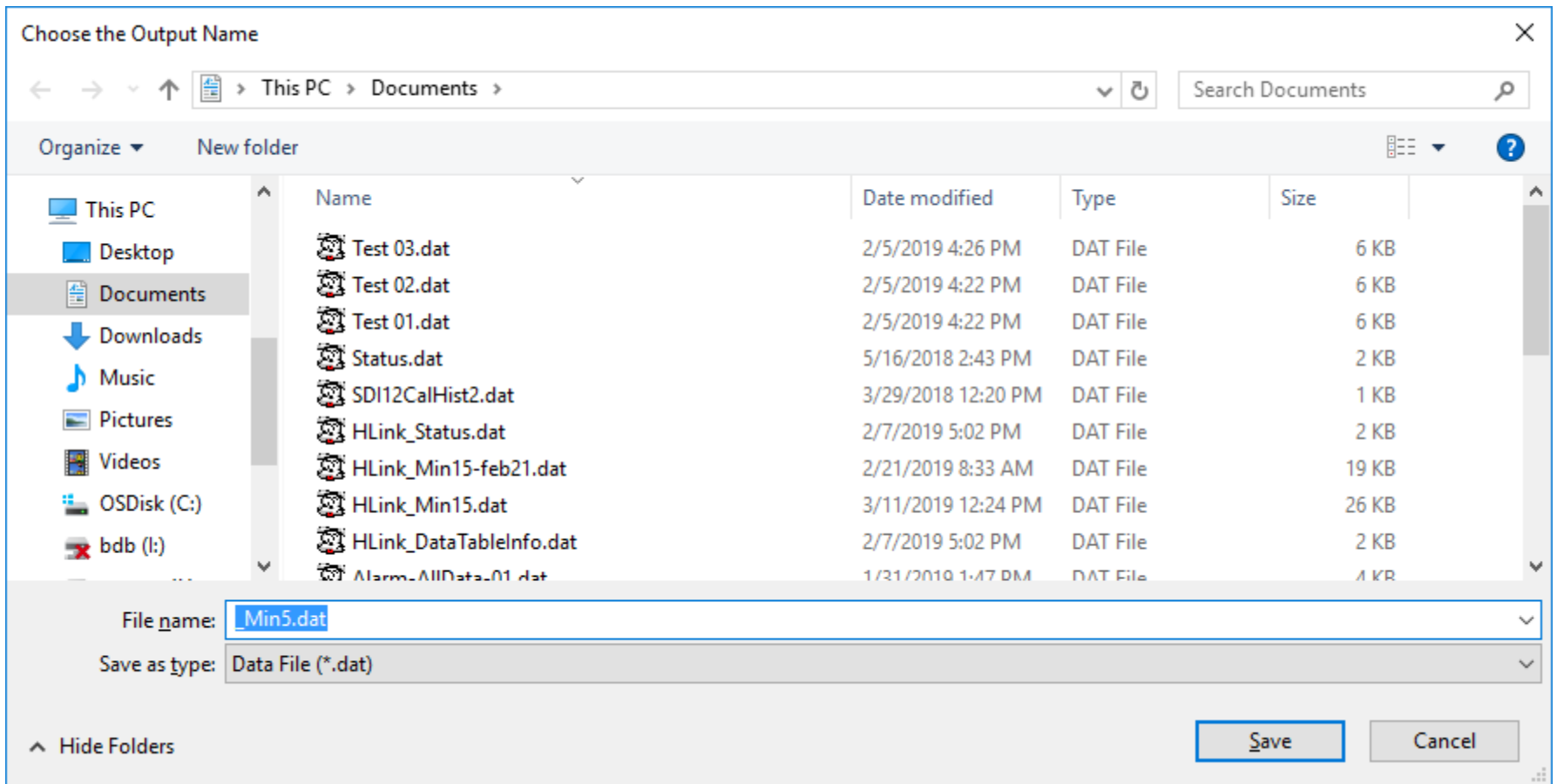
Data Monitor - 3



There are several data tables to choose from. Several of the data tables are for diagnostics and normally do not need to be collected

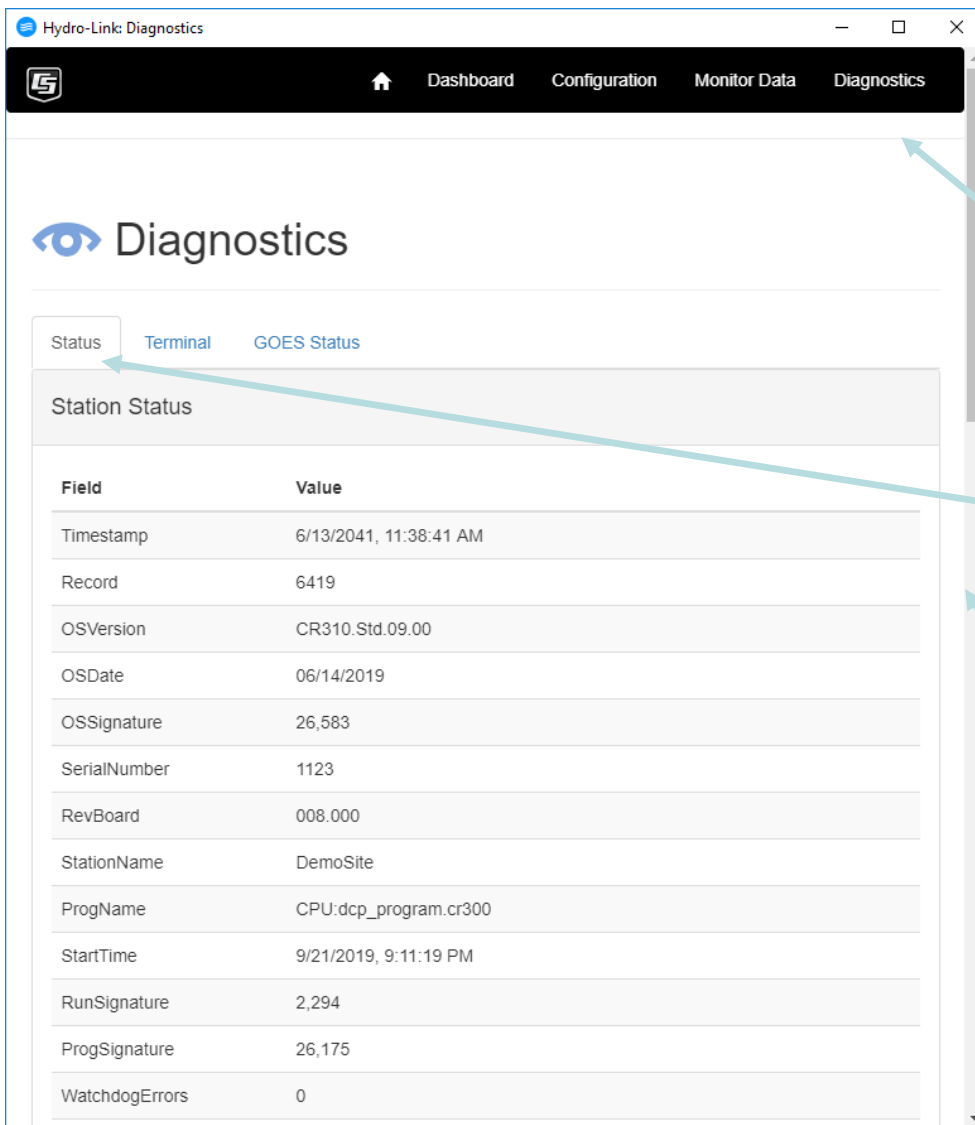
The table holding the data from the sensors is normally called Min5 or Min15 for 5 minute data or 15 minute data. In this example it is Min5, select this table and click on the **Collect** button

Data Monitor - 4



After clicking on the **Collect** button, the normal windows File Save dialog box is displayed allowing the data file to be saved. The data file may also be renamed or saved to some other location other than the default location

Diagnostics - 1



Hydro-Link: Diagnostics

Dashboard Configuration Monitor Data Diagnostics

Diagnostics

Status Terminal GOES Status

Station Status

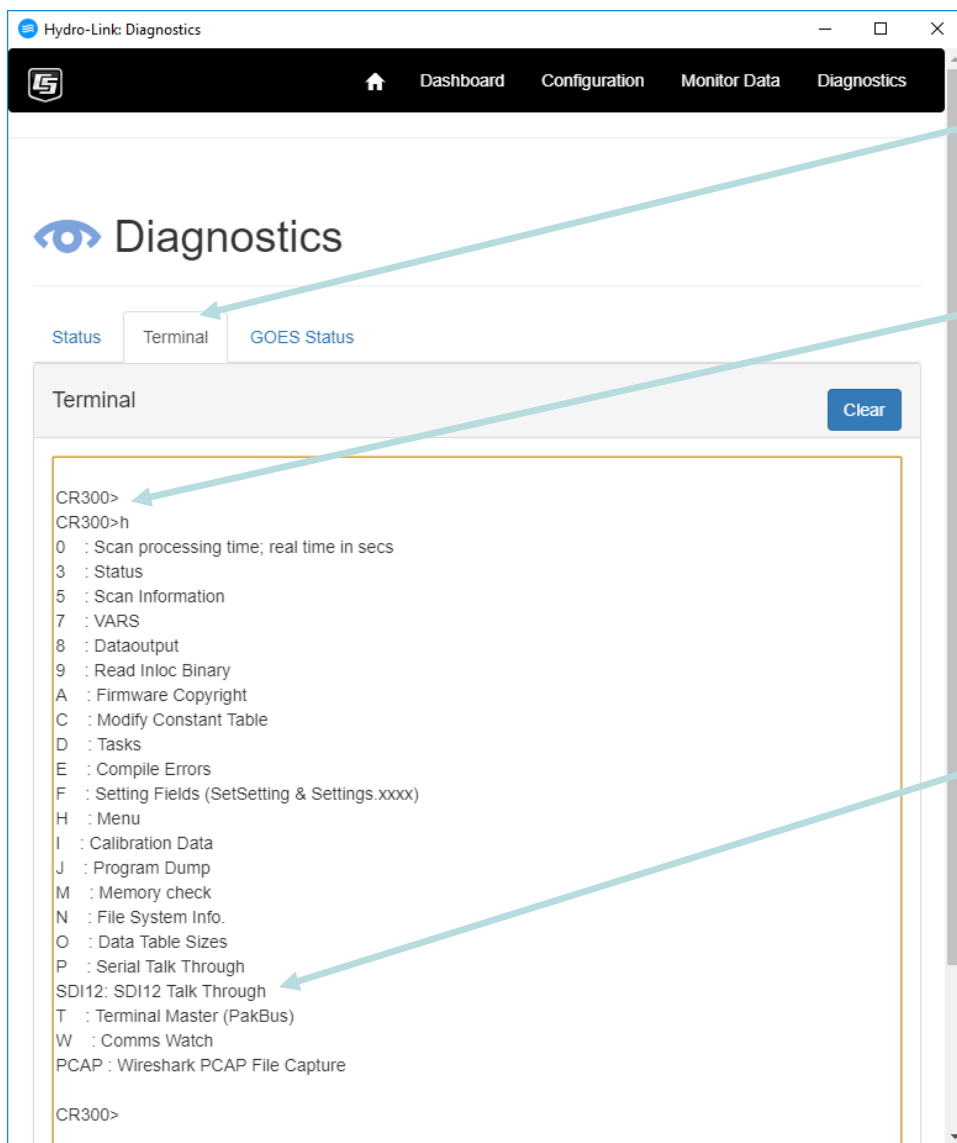
Field	Value
Timestamp	6/13/2041, 11:38:41 AM
Record	6419
OSVersion	CR310.Std.09.00
OSDate	06/14/2019
OSSignature	26,583
SerialNumber	1123
RevBoard	008.000
StationName	DemoSite
ProgName	CPU:dcp_program.cr300
StartTime	9/21/2019, 9:11:19 PM
RunSignature	2,294
ProgSignature	26,175
WatchdogErrors	0

Use the **Diagnostic** tab to check system performance and perform other diagnostic processes

The first diagnostic screen shows the detailed status of the datalogger

Notice the scroll bar indicating there is much more status information below

Diagnostics - 2



The screenshot shows the 'Hydro-Link Diagnostics' web application. The top navigation bar includes 'Dashboard', 'Configuration', 'Monitor Data', and 'Diagnostics'. The 'Diagnostics' section has three tabs: 'Status', 'Terminal', and 'GOES Status'. The 'Terminal' tab is active, displaying a list of diagnostic options. The options are:

- CR300>
- CR300>h
- 0 : Scan processing time; real time in secs
- 3 : Status
- 5 : Scan Information
- 7 : VARS
- 8 : Dataoutput
- 9 : Read Inloc Binary
- A : Firmware Copyright
- C : Modify Constant Table
- D : Tasks
- E : Compile Errors
- F : Setting Fields (SetSetting & Settings.xxxx)
- H : Menu
- I : Calibration Data
- J : Program Dump
- M : Memory check
- N : File System Info.
- O : Data Table Sizes
- P : Serial Talk Through
- SDI12: SDI12 Talk Through
- T : Terminal Master (PakBus)
- W : Comms Watch
- PCAP : Wireshark PCAP File Capture

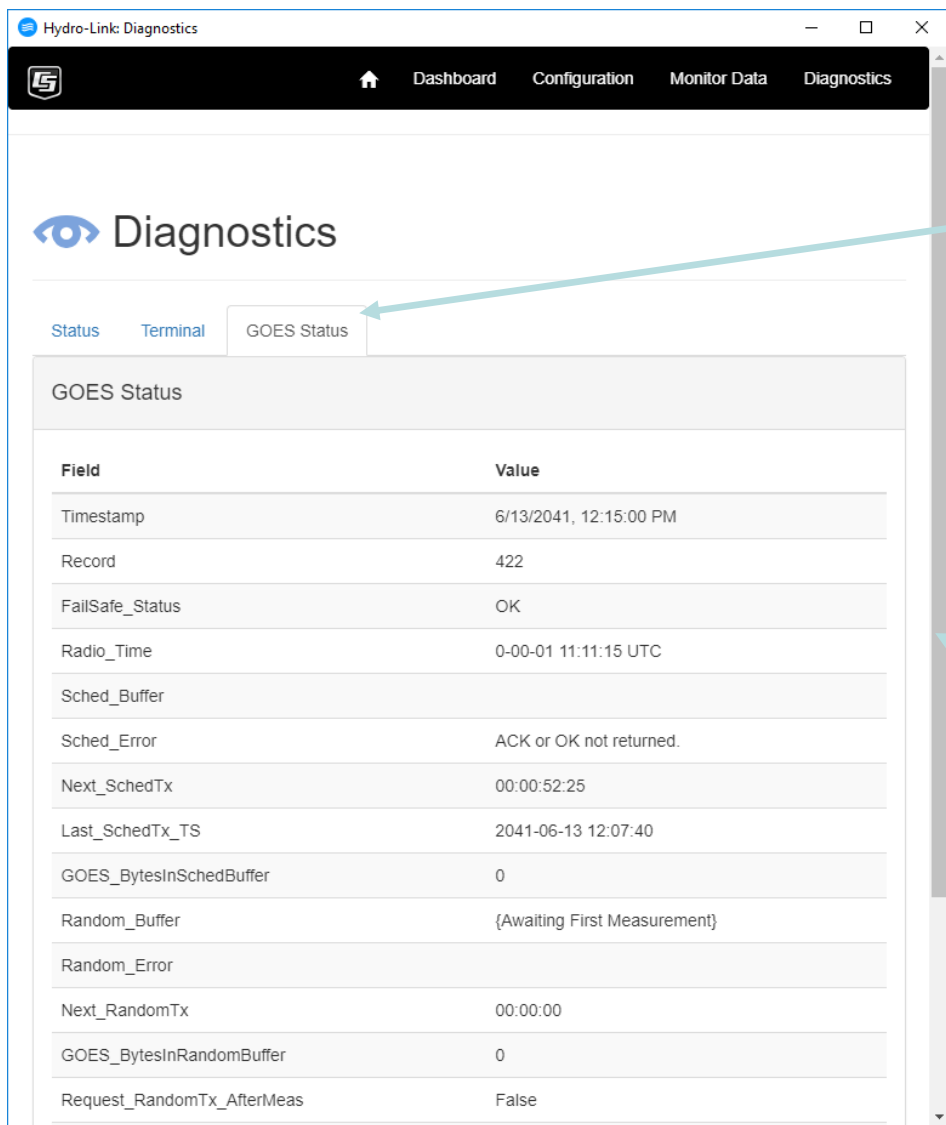
The prompt 'CR300>' is visible at the bottom of the terminal window.

Under the Terminal tab are several options. Once the Terminal tab is clicked, press the ENTER key a few times to get the prompt, **CR300>**

Once the prompt is displayed, press the **H** key for Help and then the ENTER key to display the menu for the terminal tab. See the menu to the left

One of the most used options here is the **SDI12 Talk Through** option. It is used to send commands to SDI-12 sensors. It is often used to make sure a sensor is configured correctly

Diagnostics - 3



The screenshot shows the 'Hydro-Link: Diagnostics' web application. The navigation bar includes 'Dashboard', 'Configuration', 'Monitor Data', and 'Diagnostics'. The 'Diagnostics' section is active, showing a 'GOES Status' tab. The tab contains a table with the following data:

Field	Value
Timestamp	6/13/2041, 12:15:00 PM
Record	422
FailSafe_Status	OK
Radio_Time	0-00-01 11:11:15 UTC
Sched_Buffer	
Sched_Error	ACK or OK not returned.
Next_SchedTx	00:00:52:25
Last_SchedTx_TS	2041-06-13 12:07:40
GOES_BytesInSchedBuffer	0
Random_Buffer	{Awaiting First Measurement}
Random_Error	
Next_RandomTx	00:00:00
GOES_BytesInRandomBuffer	0
Request_RandomTx_AfterMeas	False

Under the GOES tab are several status messages related to the GOES radio and its operation

This information is much more detailed than that displayed on the dashboard.

Notice the scroll bar indicating there is more information listed below

Conclusion

- Use the demo site to try Hydro-Link most any time
 - Realize others may be on there at the same time so some actions may act differently than expected
 - There are no sensors connected to the site so data values may show up as NAN (Not a Number)
 - A GOES radio is not connected to the site but all GOES options are still available
-
- Demo site link: `ip-218.campbellsci.com`
 - User Name / Password: `admin / admin`

? Questions



Thank You