Stage Discharge Recorder with 9210 Datalogger Series

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INTEGRATION GUIDE

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Introduction

The stage discharge recorder is one of Sutron's water level sensors. This guide will describe the proper method of connecting the sensor with the 9210 datalogger. This will apply to all dataloggers in the 9210 series. The configuration of the software will be the same for the Xpert datalogger series, but the wiring diagrams will be different.

Sensor Options

There are several types of ultrasonic wind sensors that commonly integrate with Sutron dataloggers. The differences are the communication protocol used to interface with this sensor.

Part Number

SDR-0001-1	SDR, with shaft encoder only, battery cable included, SDI-12 or 4-20mA
SDR-0001-1SD	SDR-0001-1 with SD Card option
SDR-0001-3	SDR w/Analog Input & 4-20mA outputs, The Analog Stage Discharge Recorder does not include a shaft encoder, which is ordered separately.
SDR-0001-3SD	SDR-0001-13 with SD Card option
SDR-0001-4	SDR w/Analog Input, 4-20mA outputs, & shaft encoder Includes a shaft encoder
SDR-0001-4SD	SDR-0001-4 with SD Card option

SDR-0001-1

SDR-0001-4

Sensor Accessories

The stage discharge recorder has six components required to make it function. These parts are the weight, float, end hook set, tape or chain, wheel, and the stage discharge recorder. The wheel attaches directly to the stage discharge recorder and the tape or chain hangs over the wheel with one end tied to the weight and the other end tied to the float. The end hook set is what attaches the weight and float to the tape or chain. If the SD option of the recorder is purchased then another accessory that can be added is a SD card that stores data directly from the sensor.

Accessory Part Numbers

5100-0530-1	Float 6" Copper
5100-0520-1	Float 4" Copper
5100-0530-2	Float 5" PVC
5100-0520-2	Float 4" PVC
5100-0550	Counterweight 8oz
5100-0540	Counterweight 4oz
5100-0620-1	End Hook Set
6661-1213	2 GB SD Card

Steel Tape Standard US Options

5100-0501	Tape Wheel, 1ft rev, 1/4" Shaft, Alum, 2.4" interval punch
5100-0502	Tape Wheel, 1ft rev, 5/16" Shaft, Alum, 2.4" interval punch
4211-1010-100	100ft Tape Perf, Steel 2.4" center
4211-1010-75	75ft Tape Perf, Steel 2.4" center
4211-1010-50	50ft Tape Perf, Steel 2.4" center
4211-1010-35	35ft Tape Perf, Steel 2.4" center
4211-1010-25	25ft Tape Perf, Steel 2.4" center
4211-1010-15	15ft Tape Perf, Steel 2.4" center

Steel Tape Metric Options

5100-0503	Tape Wheel, 500mm rev, 1/4" Shaft, Alum, 2.4" interval punch
5100-0504	Tape Wheel, 500mm rev, 5/16" Shaft, Alum, 2.4" interval punch
4211-1008-25	25m Perforated Unmarked Steel Tape, 12.5 c.m. center
4211-1008-15	15m Perforated Unmarked Steel Tape, 12.5 c.m. center
4211-1008-10	10m Perforated Unmarked Steel Tape, 12.5 c.m. center

Beaded Chain Metric Option

5100-0118	Beaded Wheel, 375mm rev, 5/16" Shaft
5100-0581	Beaded Chain 12.5cm centers (specify length)
5100-0581-10	Beaded Chain 12.5cm centers (specify length)

Example of Complete System

SDR-0001-1SD	SDR-0001-1 with SD Card option
5100-0540	Counterweight 4oz
5100-0520-2	Float 4" PVC
5100-0620-1	End Hook Set
5100-0501	Tape Wheel, 1ft rev, 1/4" Shaft, Alum, 2.4" interval punch
4211-1010-25	25ft Tape Perf, Steel 2.4" center
6661-1213	2 GB SD Card

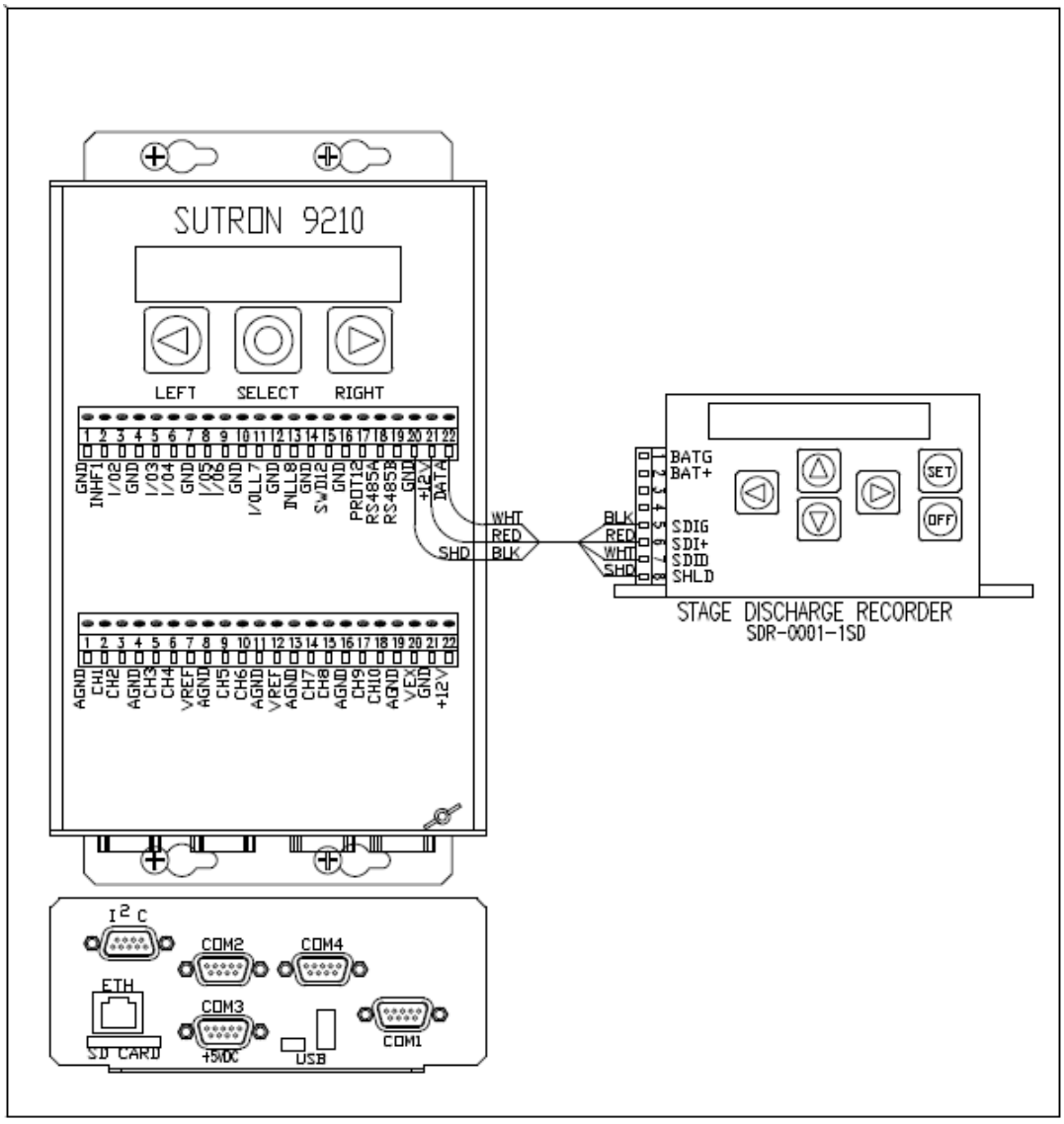
Mounting Solutions

The stage discharge recorder has no mounting kits needed for installation. The bottom of the sensor should be placed on a flat surface with four screws set to stabilize it. The wheel will have the tape or chain that will drop directly down to the water. Make sure that the tape or chain is not impeded by anything and has full range of motion when the water level raises and lowers.

Wiring Diagram

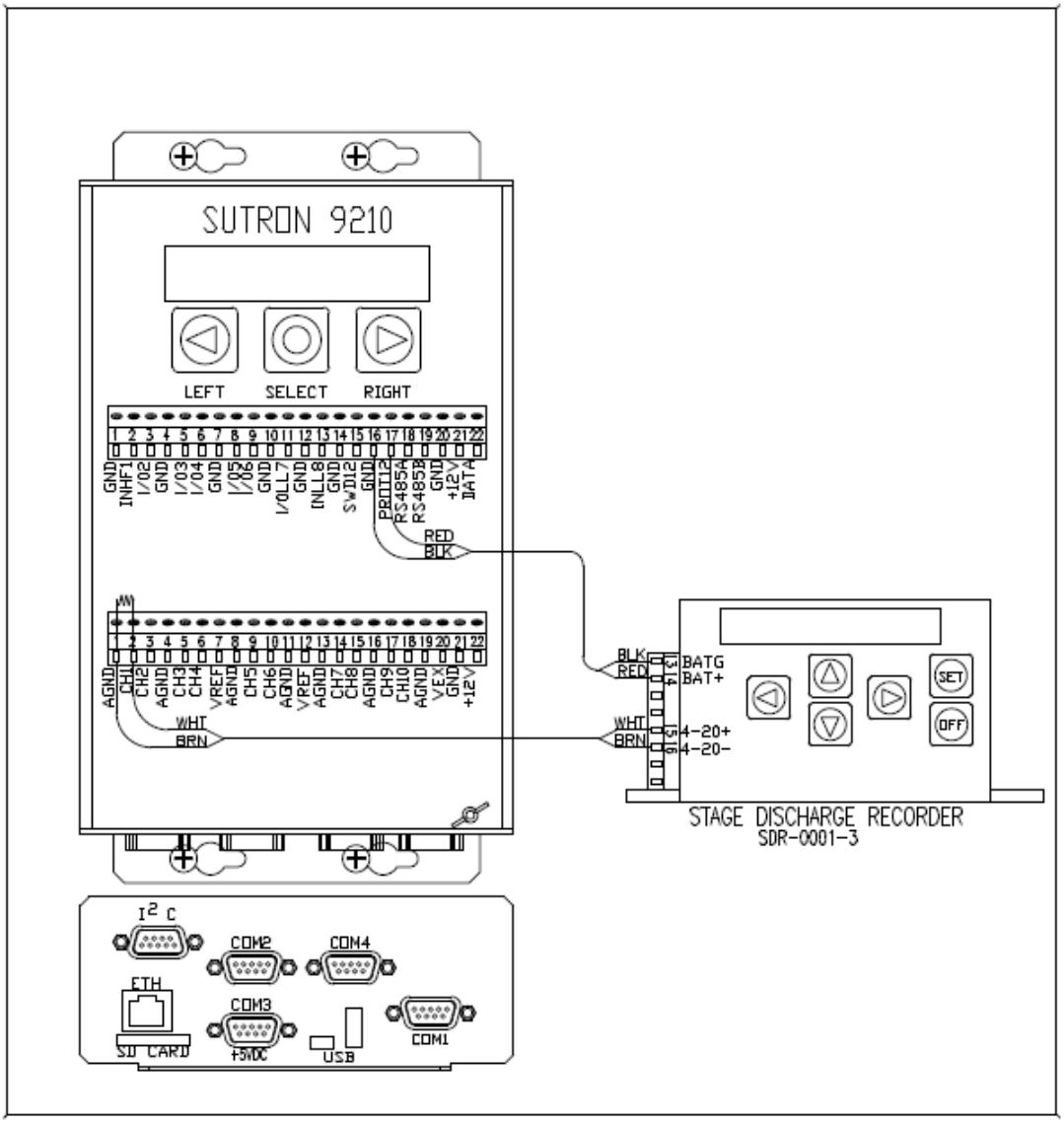
SDI-12 Wiring

Connecting the SDI-12 sensor to the 9210 is a simple task. On the top terminal strip there is a section on the far right designated for SDI-12 sensors. The sensor should have 3 wires that need to be connected, one for power, one for ground, and the last for data. The three wires connect to the power, ground, and data terminal of the 9210 as shown below.



4-20mA Wiring

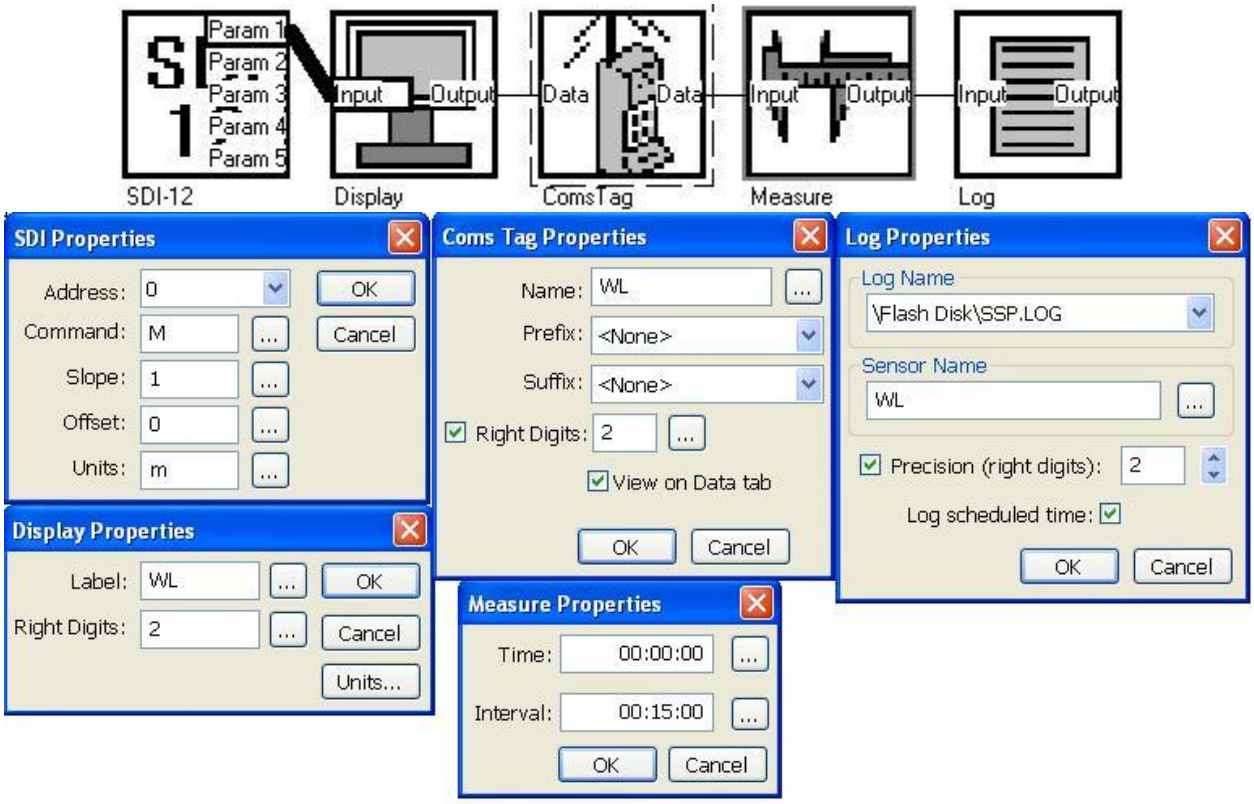
The 4-20mA version of this sensor requires power input and 4-20mA output. The power input can come from a variety of sources including the battery terminals, the switched 12VDC power the logger provides, or the protected 12VDC power the logger provides. The diagram below shows the connection to protected 12VDC. The 4-20mA output is a two wire connection that can be located on any of the analog channels located on the lower terminal strip. The position wire connects to the channel and the negative 4-20 wire connects to the ground. There is also a resistor required to complete the connection so that the current can be read by the datalogger. The resistor connects between the positive and negative 4-20mA connection as shown below. This allows the resistor to be connected in parallel to the current loop.



Common Configurations

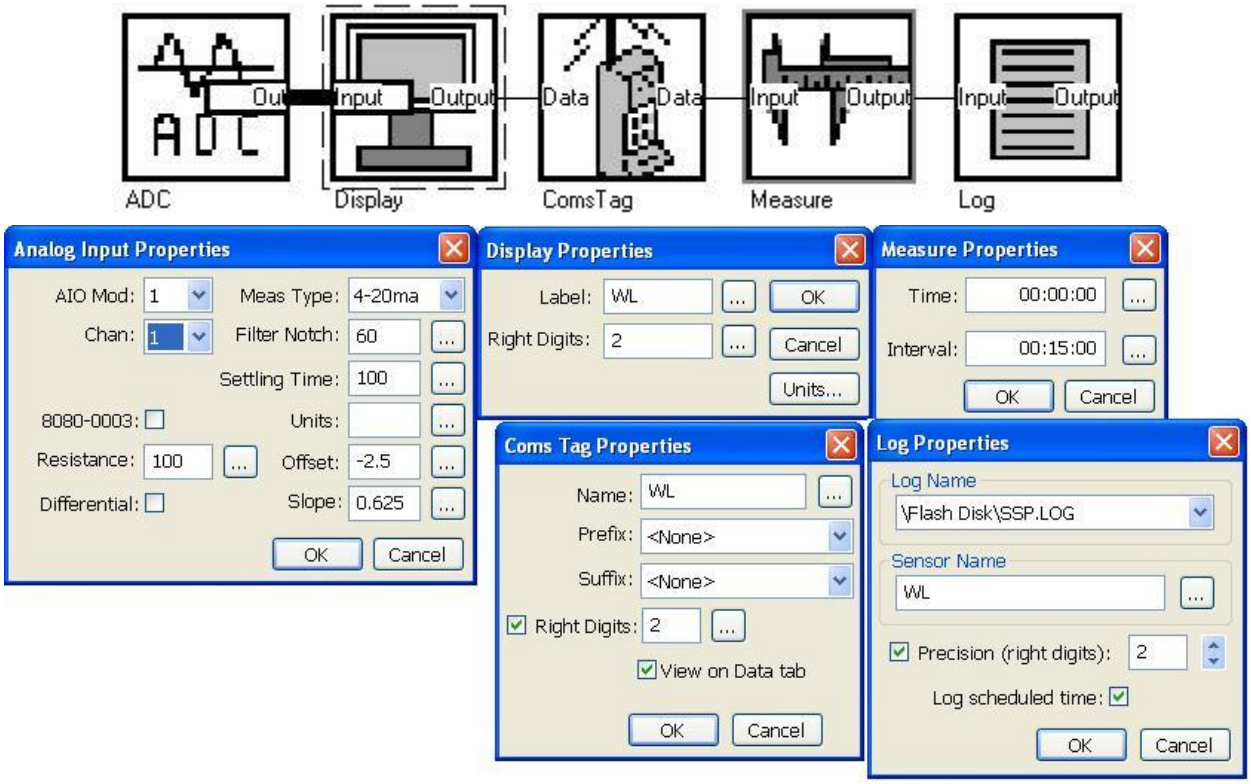
SDI-12 Configuration

The 9210 utilizes a graphical setup in order to configure the sensors that are connected. The graphical setup is a series of blocks connected to depict a diagram showing how the data is managed. A typical series of blocks would be an Input, Display, Coms Tag, Measurement, and then a Log block. With this series the sensor would be measured based on the parameters of the input block, then the value would be visible on the front display of the logger, the data tab in the graphical setup would be updated, the measurement interval is defined, and then the value is logged in the log file. Alarms can also be added to the data management series by placing an alarm block before the Coms Tag block. For more detail on how to program a 9210, use the 9210 Operations and Maintenance Manual. The descriptions below will provide a concise description of common measurement setup for the SDR sensor measured every 15 minutes.



4-20mA Configuration

The 4-20mA configuration is identical to the SDI-12 configuration except for the input block. There is a, ADC block that needs to be used as the input in order to properly communicate with the 4-20mA loop. The ADC block is an analog to digital converter. This block allows you to specify the module and channel the sensor is connected to, the 4-20mA measurement type, and the value of the resistor used. The properties for all of the blocks are shown below the graphical layout.



Summary

This guide has described the detailed options of the stage discharge recorder as well as how to connect it to the 9210 datalogger. If you have any questions about this integration guide, or if additional guidance is needed getting started or troubleshooting then please contact Sutron's Integrated Systems Division at 703-406-2800.