Connecting a Tipping Bucket Rain Gauge

Introduction

A basic feature of all Data Dolphin datalogger's is the ability to record the time of an electrical switch closure event. This makes the Data Dolphin an excellent choice for capturing the tipping event of a tipping bucket style rain gauge. This document describes how to correctly connect a tipping bucket rain gauge to a Data Dolphin and properly configure the Data Dolphin inputs to capture and record the tipping event.

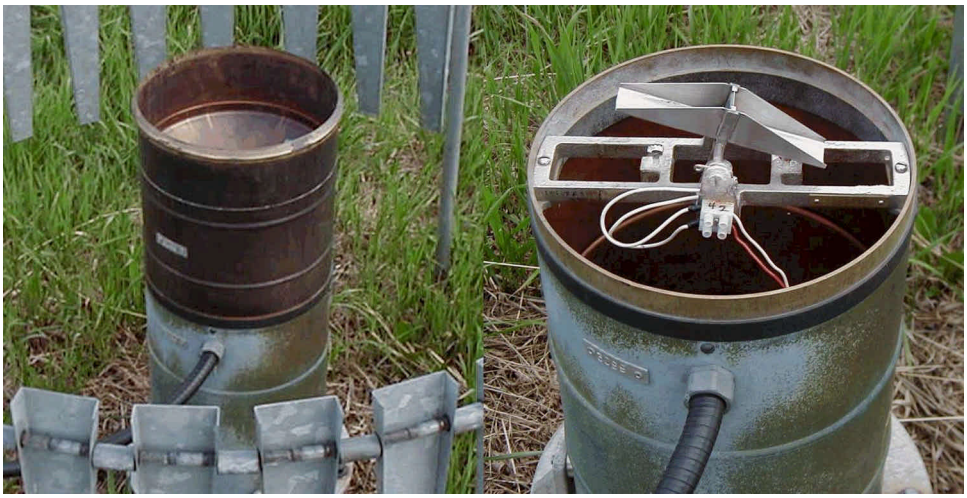

Figure 1: Rain gauge bucket and tipping mechanism.

The Rainfall Data Collection System

A typical rainfall data collection system usually consists of the following basic components:

- A rain gauge wind screen
- A rain gauge, consisting of a collection funnel, bucket, and tipping mechanism
- A 2-conductor, shielded cable
- A datalogger to capture and record the tipping event

Other equipment which may or may not be included in a rain data collection system include rain gauge mounting and leveling equipment, a datalogger weather enclosure, data communication equipment and a remote power source.

As a general rule, rain gauges are securely mounted, away from objects that obstruct the wind, with the funnel orifice and tipping mechanism being level. Consult your rain gauge manufacturer for exact mounting and location specifications.

Ideally, you will want your Data Dolphin datalogger mounted in a convenient location indoors, but if this is not possible, consider mounting it in a locked weatherproof enclosure (Optimum part no. FB12106/MB12106).

Wiring the Rain Gauge to the Data Dolphin Datalogger

The wiring of the switch on the tipping bucket mechanism to the Data Dolphin's pulse inputs is simple and straightforward, as polarity does not matter. A good convention to adopt, if using a shielded signal cable, is to use the white wire as the signal, and black wire as the signal return. After securing both of these wires to the screw terminals in the tipping bucket mechanism, connect the white wire to a pulse input terminal on the Data Dolphin, and the black wire to the ground terminal. If a green wire or shield wire is present, it also may be connected to a ground terminal of the Data Dolphin to dissipate any stray static signals. Up to four tipping gauges can be connected to a DD-128 in this manner.

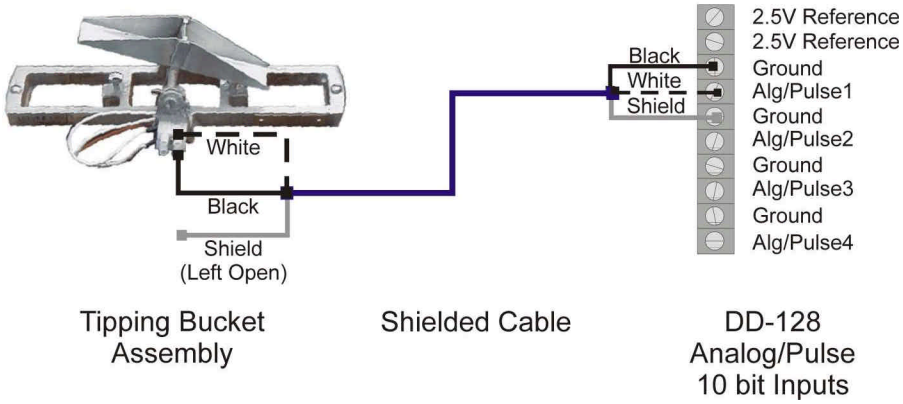

Figure 2: Wiring a rain gauge to the Data Dolphin's standard inputs

Configuring the Data Dolphin for Rain Gauge input

The final step in integrating a Data Dolphin into a rain data collection system is to configure the Dolphin's standard inputs to capture the rain gauge tipping event using the Data Dolphin software. This will require having a copy of the Data Dolphin software installed on a Windows based PC, and an active communication link (wireless or direct cable) to the Data Dolphin data logger. For more information on installing the Data Dolphin software and establishing a communication link, consult the Data Dolphin Software manual.

To configure a standard Data Dolphin input to capture rain gauge data:

1. Open the Data Dolphin software and establish a communication session with the Data Dolphin in your rain gauge system. Click on the Setup button on the main toolbar in the Data Dolphin software to open the setup window.
2. Next, click on the Load from Dolphin button in the bottom left-hand corner of the Setup window to view the currently connected Data Dolphin's input configuration and to prepare it for programming.
3. Click on the Standard Inputs tab to bring this page to the front. Next, enable the input control that is connected to the rain gauge by clicking its "On" checkbox. Select the counter option button to configure the input for event counting, and enter a descriptive name for this input. Choose an immediate record interval to cause the Dolphin to immediately record the time of the event when the input is switched to ground (when a tip occurs). As an example, the standard input page of the Setup window is shown in Figure 3 below with input 1 enabled and correctly configured to capture a rain gauge tipping event.

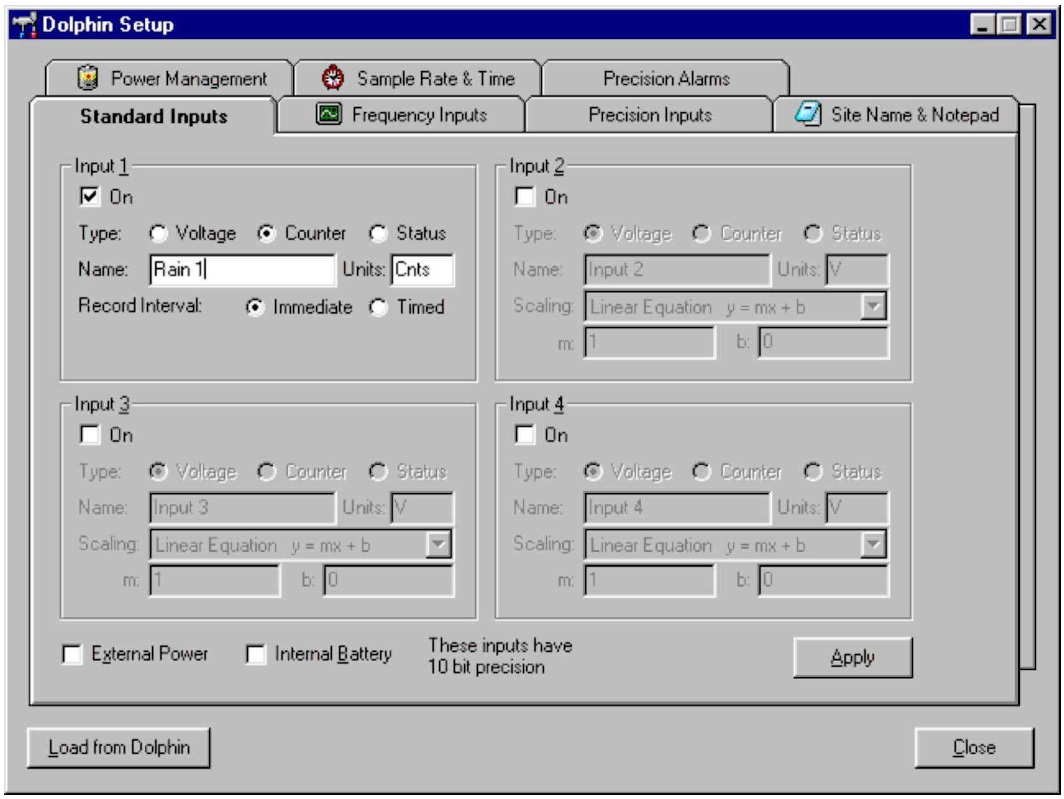

Figure 3: Configuring a standard input for rain gauge data.

4. Repeat steps 1 and 2 for any additional rain gauges attached to this Data Dolphin unit and disable any unused input. When the inputs are satisfactorily configured, program the changes into the Data Dolphin's memory by clicking the Apply button.
5. Finally, click on the Sample Rate and Time window in the setup window to correctly set the Data Dolphin's clock and ensure that it records the true time of a tipping event.