

Configuring Pulse Accumulation Type Sensors Sensor Application Note #10

Overview

This Sensor Application Note provides details regarding the support for pulse accumulation type sensors in MultiLogger. These sensors include flowmeters, traffic counters, rain gages, and any other sensor which outputs an electronic pulse that corresponds to some unit of measure which must be accumulated to obtain accurate measurements.

This application note will provide direction regarding the 3 types of sensors above, this information can also be applied to a number of other similar sensors. Contact Canary Systems if your application requirements are beyond the scope of this document or you have questions regarding the configuration.

NOTE: Some features described in this document apply to MultiLogger version 2.1.5 or newer, specifically the ability to edit the pulse measurement instruction files, contact Canary Systems or your software vendor to obtain updates to your software. Software updates are available free of charge to registered users.

Background

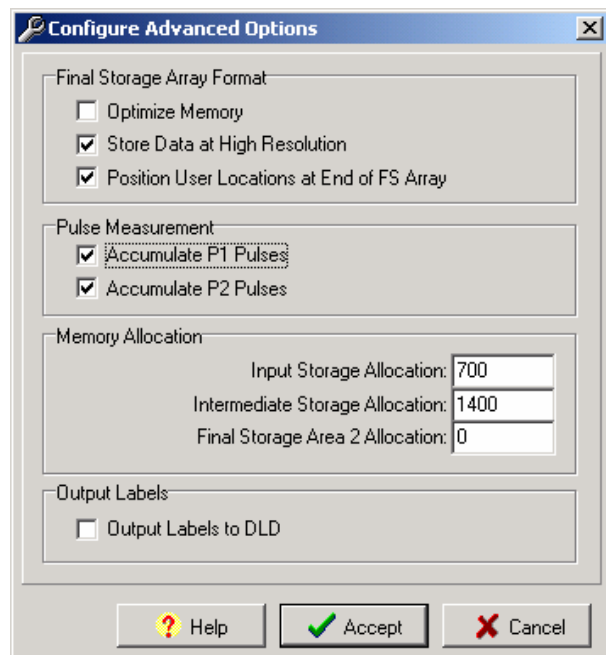
Pulse output measurements are a challenge for a variety of reasons:

- Pulses must usually be accumulated from one scan to the next, some options of MultiLogger will actually scan multiple times between storage of data, these pulses must be accumulated from one scan to the next. For example, when reading a rain gage, all pulses must be counted or the total quantity of rain will be in error.
- There are some quirks of the Campbell dataloggers which MultiLogger has accounted for with its support for these measurements.
- The pulse output type can vary considerably from one sensor type to another, for example some flowmeters may have very low voltage sine wave type pulse output, while a rain gage will be a switch closure type device, the basic measurement requirements are the same but the electrical signal is quite different.

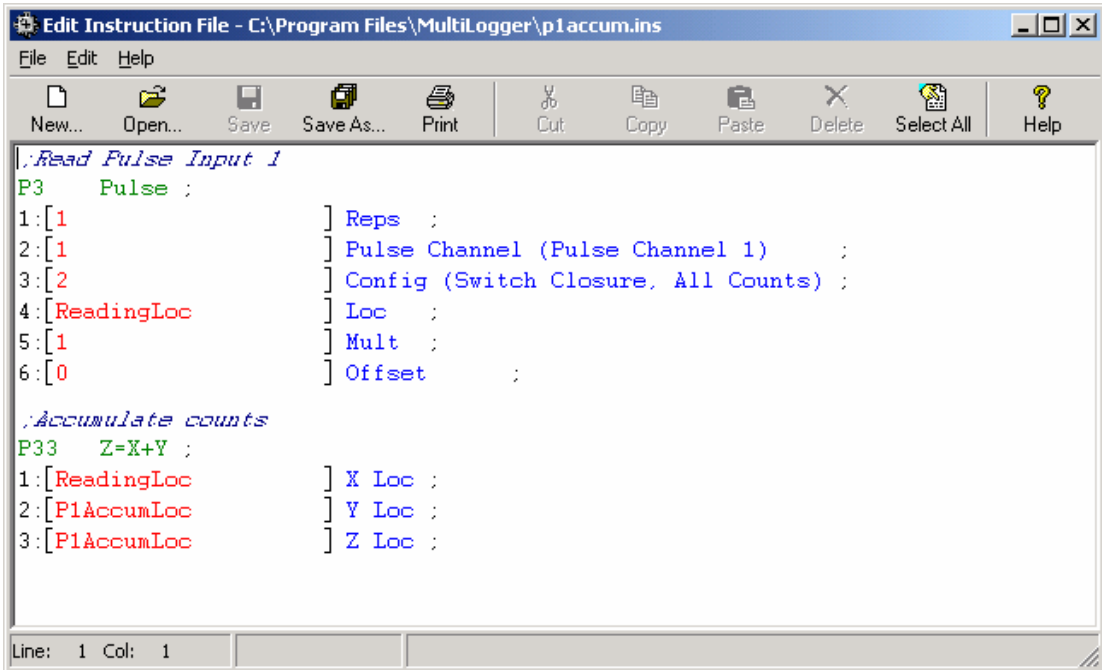
MultiLogger Configuration

There are 3 major MultiLogger configuration issues to address in configuring these sensors:

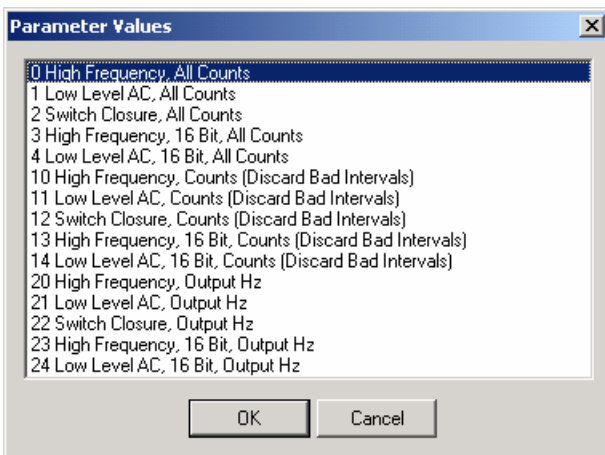
1. You must configure the Pulse Measurement group on the **Program | Advanced Options** form of MultiLogger, shown at right. Note the checkboxes for Accumulate P1 Pulses and Accumulate P2 Pulses, for each sensor connected to the pulse input channels the corresponding box **MUST BE CHECKED**.



- The pulse measurement instruction files must be edited to match the type of sensor connected to the pulse input channel. The files are **P1ACCUM.INS** and **P2ACCUM.INS**, they are located in the \Program Files\MultiLogger directory. They are edited with the Mleditor program installed in the \Program Files\MultiLogger directory. A shortcut to Mleditor is also found in the MultiLogger program group.



Note the 3rd parameter of the first instruction, the P3 instruction. This parameter defines the type of input signal the system must read. The codes that may be entered are shown below.

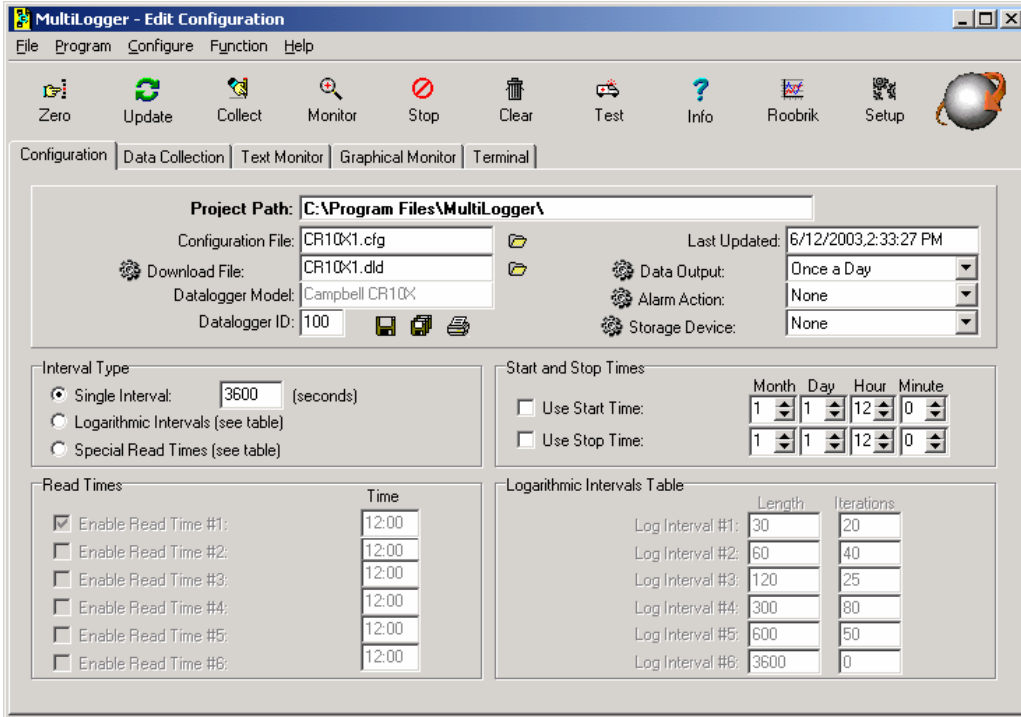


See the table below for commonly used sensors and corresponding configuration codes:

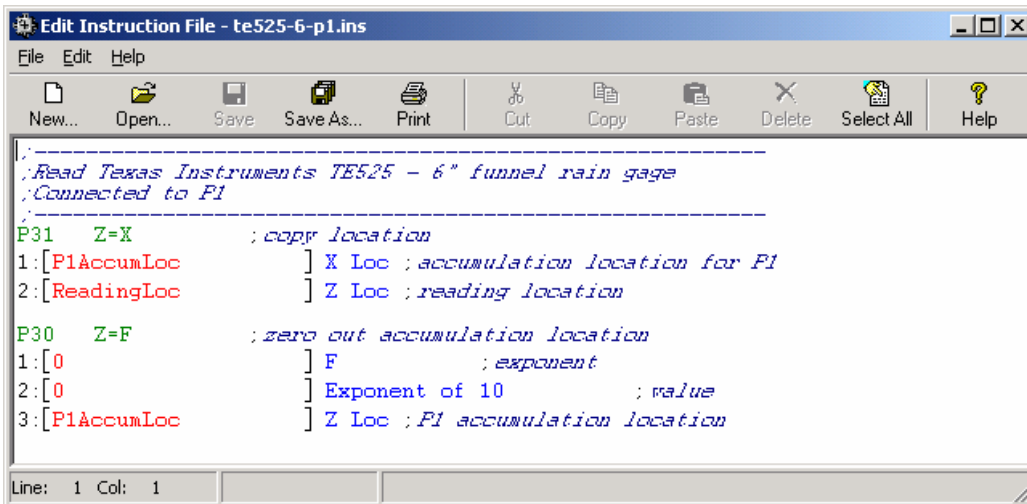
Sensor	Code	Description
Flowmeter	1	Low-level sinusoidal signal from magnetic pickups.
Tipping Bucket Rain Gage	2	Mechanical switch closure.
Ace Traffic Counter	1	Electronic switch closure.

When modifications are complete press the **Save** button. Be sure to edit both files if 2 sensors are being read.

- You must take into account the configuration of the **Data Output** option as it relates to the accumulation or totalizing of counts. For example, lets assume the following configuration:



If this configuration was used, without additional modifications the system would store the accumulation of pulses or counts only over the last hour of the day, in the case of a rain gage then 23 hours of accumulated precipitation would be lost! So what do we do? You will need to make 2 modifications, one to the instrument instruction file(s), the second to the **Data Output** option. By default every time the instrument is read, using the **Single Interval** setting, in the case above, once per hour, the accumulated pulses are normally cleared. This can be seen in the instructions shown for the **Direct | Texas Instrument | TE525-6"-P1** model.



Position the cursor to the left of the letter 'P' of the P30 instruction and press <DELETE>. This will remove the instruction which clears accumulated pulses. Press **Save**, close the editor.

Next, load the **Data Output** option shown on the Configuration tab into the editor by clicking on the gear button. The default configuration is shown below, as can be seen it simply executes the StoreSub, or data storage subroutine, every day at midnight.

```

Edit Instruction File - daily.ins
File Edit Help
New... Open... Save Save As... Print Cut Copy Paste Delete Select All Help

;Output Data once a day
P89 If (X<=>F) ;
1:[TimeLoc ] X Loc ;
2:[1 ] Comparison Code Option (=) ;
3:[0 ] F ;
4:[StoreSub ] Command Code Option ;

Line: 7 Col: 1

```

You will need to modify the file as shown, insert instructions by simply typing the number, i.e. “30” for instruction P30, at the appropriate location and then press <ENTER>. As can be seen the instructions to execute at midnight each day have been expanded to call the data storage subroutine and then reset the accumulated pulse counter (add a second P30 with P2AccumLoc if a second instrument is being utilized).

```

Edit Instruction File - daily.ins
File Edit Help
New... Open... Save Save As... Print Cut Copy Paste Delete Select All Help

;Output Data once a day
P89 If (X<=>F) ;
1:[TimeLoc ] X Loc ;
2:[1 ] Comparison Code Option (=) ;
3:[0 ] F ;
4:[30 ] Command Code Option (Then Do) ;

P86 Do ;
1:[StoreSub ] Command Code Option ;

P30 Z=F ;
1:[0 ] F ;
2:[0 ] Exponent of 10 ;
3:[P1AccumLoc ] Z Loc ;

P95 End ;

Line: 1 Col: 1

```

Be sure to Update your system after making these changes to your configuration and instruction files!