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Defining Custom Processing for CR800/1000 Channels

MultiLogger Application Note #20

Overview

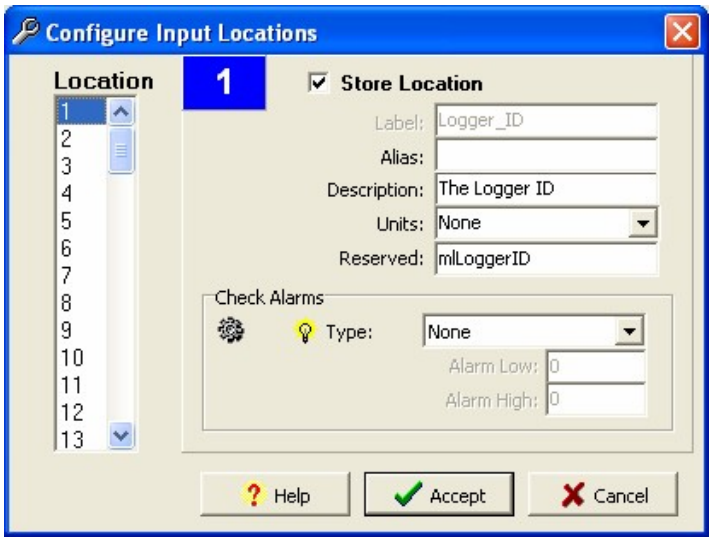
The CRBasic programming language built into the CR800 and CR1000 MCU's provides a flexible and powerful programming construct. This MultiLogger Application Note will detail how this functionality may be used within the MultiLogger framework to provide for more involved processing or measurements.

MultiLogger Configuration

There are 3 steps to configuring the custom programming, first to define the array of locations that will be used for the result of the calculations, second to configure the use of the generic Processing File and third, the actual programming to be utilized in the processing of the measurements.

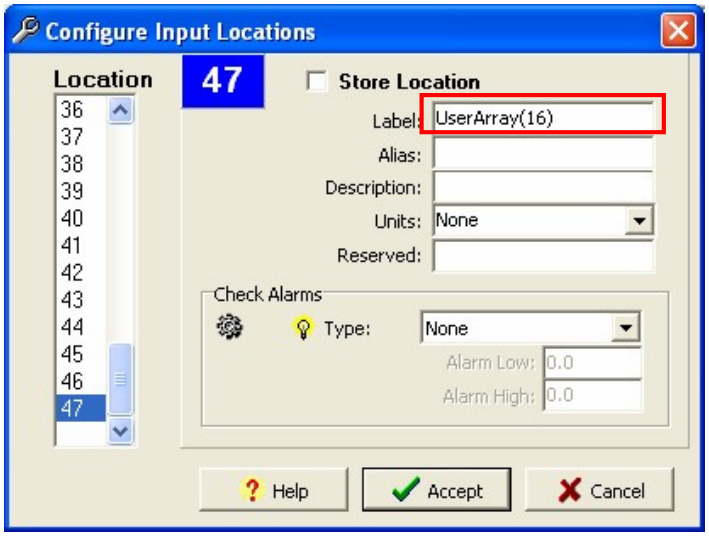
Step 1 – Define Array

Use the menu option **Program | Input Locations** (or the button on the Program tab) on the Logger form to display the **Configure Input Locations** form. This form provides access to the locations in the memory of the MCU which are used to store values. It allows defining new locations, configuring their storage, Alias, Units and Check Alarms.



The **Location** list provides quick access to locations by sequence number. Note that grayed out **Labels** are locations that are "Reserved", i.e. in use by the system.

Scroll to the bottom of the list, by default this will be location 47.



Enter the label as shown, but dimension the array to match the number of channels that will have the processing applied. In the example, 16 locations will be created.

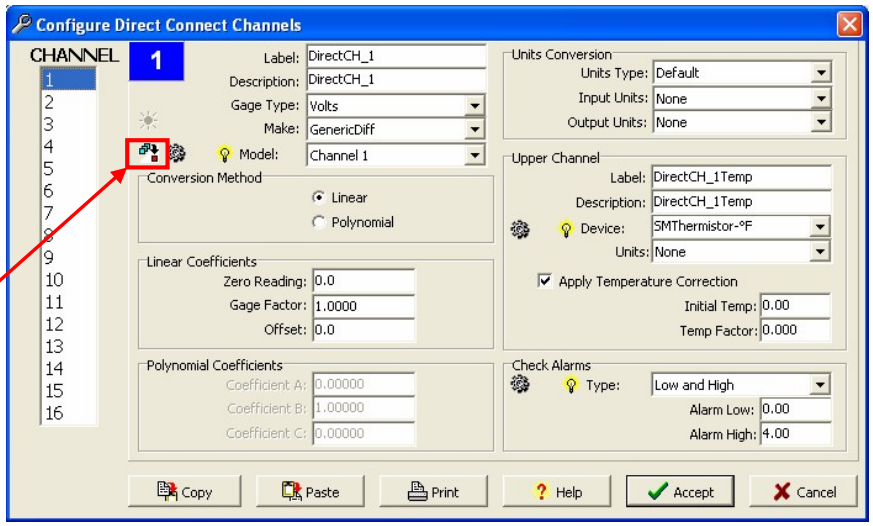
Press **<ENTER>**, note the Location list will expand to match the size of the newly created array.

You will also want to configure **Store Location** if you want the location stored to Final Storage. You can also configure the **Alias**, or label shown in the Text Monitor, a **Description**, **Units** and **Check Alarms**.

See the MultiLogger Users Guide for more information on these options.

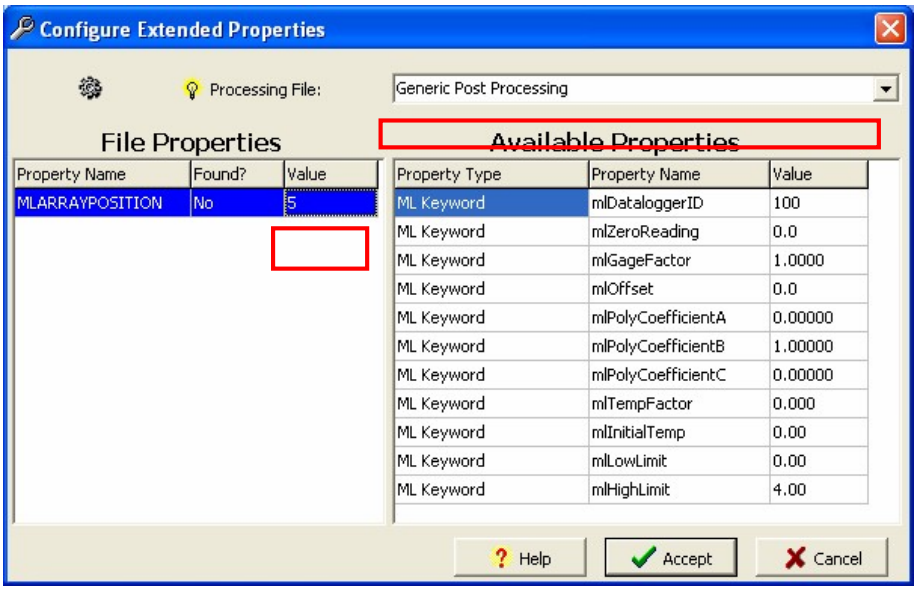
Step 2 – Select Processing File

The second step requires configuring the use of the Processing File | Generic Post Processing for the channel. The array location to store the result must also be configured. Advance to the Direct Connect or Multiplexer **Channel Configuration** form for which the processing will be applied.



Press the **Extended Properties** button on the form, located to the left of the gear instruction file editing button, for the channel to which additional processing must be applied.

This will display the **Configure Extended Properties** form. Select the **Generic Post Processing** selection from the drop-down.



Note: Depending on your version of MultiLogger this option may not be shown. It can be added by configuring the multilogger.ini file found in the Program Files | MultiLogger | CR800 or CR1000 folder (depending on which MCU you are currently working with.

Load the **multilogger.ini** file into a text editor and add the following line to the **[Processing Files]** section (scroll down to find this section):

```
File#8=Generic Post Processing,pf_generic.cr1,Generic user customizable
processing file - define UserArray(nn) using Configure | Input Locations form
```

You will also need to create a blank file named `pf_generic.cr1` in the CR800 or CR1000 folder.

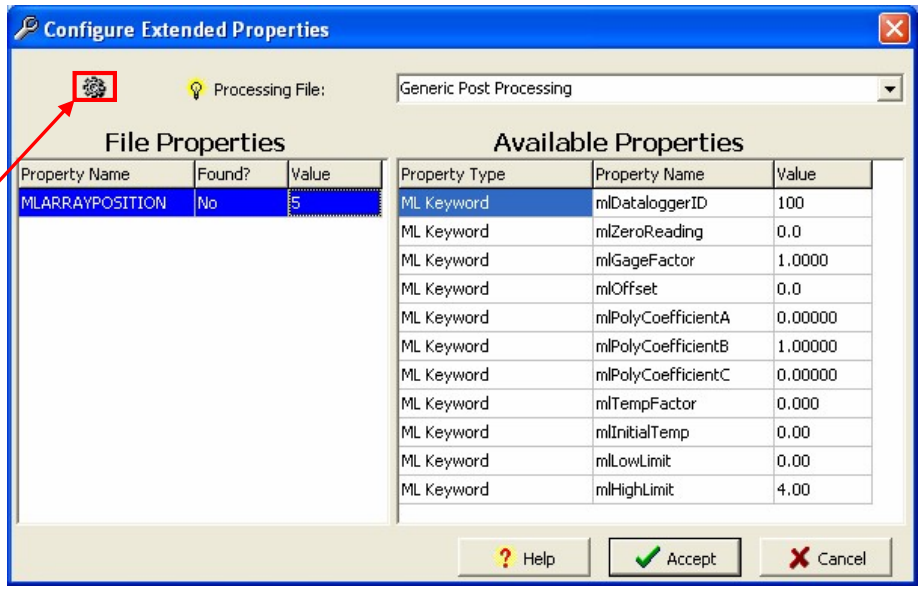
After selecting the Generic Post Processing option from the drop-down you will notice the **File Properties** grid will update and the Property MLARRAYPOSITION will be shown as not found. This specifies where in the array that was defined using the Configure Input Locations form the result for the calculations are to be found. Enter a number in the **Value** cell that corresponds to the array position.

For the example shown the result will be found in the UserArray(5) location. Use the **Configure | Input Locations** form to configure the Alias or label shown in the Text Monitor, otherwise the default of **UserArray(5)** will be used.

Step 3 – Configure Programming

The last step involves configuring the actual programming to be used for the processing. The Generic Post Processing file contains instructions and some sample programming.

Use the gear button located to the left of the Info button on the Configure Extended Properties form to load the programming into MLEditor.



The programming loaded in the editor is shown below. The example programming (shown in blue) simply multiplies the current channel by 1.0 (no change), replace programming as needed.

```
'Generic Post Processing File

'To use this file:
'1) Define a UserArray(nn) where nn refers to the number of elements
'   Use the Configure | Input Locations form to define this array
'2) Configure the array position for the destination result of processing
'   Use the Configure Process File | File Properties grid to configure the array position
'3) Configure the programming below to apply to the channel measurement
'   See the CR800 or CR1000 Operators Manual for available CRBasic instructions and operators

'The current channel (whichever channel has this Processing File selected) is represented by the
MuxReadingLoc variable
'The example below simply multiplies the current channel by 1.0 (no change to value) and stores
it in the array at defined position

UserArray(mlArrayPosition) = MuxReadingLoc(++) * 1.0
```

Once modifications are complete press <SAVE> on the toolbar to save changes, then close the editor. This programming will be saved in the Project Path and may be customized and used for any channels on the selected system.

If the programming will be different for other channels then additional drop-down selections must be added to the Processing File list (see previous instructions for adding them) and selected.

Once all Processing File selections for all channels are complete then press **Update** on the Logger form toolbar to update the system programming. If there are compile errors due to incorrect programming a compile error will be displayed.