GS 8 B Calculation Aide Software Notes

The GS 8 B Calculation Aide.xls software (Rev 1.3) implements all of the calculations covered in the GS 8 B manual (Rev 1.3) into an Excel® spreadsheet.

There are two main general converter application worksheets within the program.

The first, titled "**Calculator**", is the basic calculation set, and is appropriate for those cases where the converter has a good zero value or has been re-zeroed with the GS 8 B on the "0" knob setting. This is the sheet that is recommended for general use.

The second sheet, titled "**Calculator + Zero Compensation**" has additional provisions for comparing values with the zero offset present, and with it mathematically removed. It is appropriate for use in those cases where there is not a good zero on the converter, and it is not appropriate to re-zero the system.

General Instructions

All of the areas requiring or allowing input are indicated by cells shaded bright green, plus the meter diameter drop-down box. A number of the input entry cells also provide drop-down boxes for easy selection of the correct value. All of the other areas of the spreadsheet are locked to prevent accidental problems. The following items should be selected/entered and/or the value cross-checked to make sure it is correct (the spreadsheet does not automatically clear so that it is easier to use when there are multiple similar meters):

Entry	Type	Notes
Date Recorded, Serial #, etc …	Enter identification info as desired	Enter information for test identification; a test record may be printed. Use system print preview/print menu facilities to view/select printer as available.
Converter	Drop-down	Select converter model (This should be selected first!) (For TIDALFLUX with level detection disabled, ignore "PF" converter suffix)
Q Fullscale	Enter Max Flow Rate	Enter max flow rate value from converter
Volume/Time Units	Drop-down	Select same volume/time units as shown in converter
Meter Diameter	Drop-down	Select appropriate diameter for meter converter is used with
$I_{0\%}$	Enter Min Output Current	Typically this is 4 mA, could be different, enter value as needed
$I_{100\%}$	Enter Max Output Current	Typically this is 20 mA, could be different, enter value as needed
$P_{100\%\ (Hz)}$	Drop-down	Select value used in converter, or enter value as needed
GK / GKL	Enter Calibration Constant	Enter value from converter or data plate into available box
Observed Flowrate	Enter simulated Flowrate values	Enter simulated observed converter Flowrate values at knob setting(s) selected (Note: Separate "0" data cell entry for "zero" compensated worksheets required.)
Current(mA)	Enter "0" knob position simulated Current value	Enter simulated observed converter Current at knob setting "0" (Note: Only for separate "0" data cell entry for "zero" compensated worksheets)
Frequency(Hz)	Enter "0" knob position simulated Frequency value	Enter simulated observed converter Frequency at knob setting "0" (Note: Only for separate "0" data cell entry for "zero" compensated worksheets)
Flowrate	Enter "0" knob position simulated Flowrate value	Enter simulated observed converter Flowrate at knob setting "0" (Note: Only for separate "0" data cell entry for "zero" compensated worksheets)

As these selections (especially the choice of the converter) and values are entered, you will notice that some of the other options and values are modified so that they are appropriate for the remaining entries. The calculations are also completed for all of the appropriate entries.

If the combination of converter, full scale flow, diameter, units and GK(L) are not consistent (correct), such that Y_{MAX} is less than the lowest knob setting, the following message will display in place of Y_{MAX}: "**Conv. / Q / DN / Units Mismatch!!**" and the box will change color. When this happens, recheck the noted entries and make sure that they are correct. When the values are correct, a Y_{MAX} value should be displayed within a light green box.

The values corresponding to Y_{MAX} will be shown in the large boxes on the right (as well as in the table in the lower right). The knob setting which corresponds to Y_{MAX} is also indicated in the box below Y_{MAX}.

As a convenience for making linearity checks, the calculations for any flow rate settings which may be less than Y_{MAX} are also automatically calculated and presented, along with the values for Y_{MAX}, in the lower right table, just below the Y_{MAX} values table. Also in this table are entry boxes for recording the actual indicated flow rates at the different settings. If these values are filled in, the calculator will automatically calculate the percent deviation in the last column. It is recommended that the values in the "Observed Flowrate" column be cleared when finished to avoid confusion with later system tests.

Additional Zero Compensation Instructions

The basic layout and operation of the "**Calculator + Zero Compensation**" sheet is essentially the same as for the "**Calculator**" sheet. Only the extra features will be covered here.

The input difference is the addition of a "0" knob position readings table below the "Input Variables" table. The use of the current and frequency inputs is optional, depending on whether they are being used. Any values entered in this table will automatically be entered in the corresponding "0" setting boxes in the "With Zero Offset Included" table.

The "With Zero Offset Included" table includes entry boxes for the observed values. This table is designed to allow easy comparison with the observed values by <u>including</u> the respective zero offset values in the "compensated" calculations. Deviation calculations are made, but they are only provided for easy comparison with the corrected values in the table below and should not be the values used, so they are shaded grey.

The "Corrected for Zero" table reflects the observed values in the "With Zero Offset Included" table except that the Zero Offset values have been subtracted. The "calculated values in this table do not include the zero offset and are identical to what would have been obtained had there been no zero offset. The deviation calculations in this table are the ones that should be used in evaluating what the true deviation of the system relative to different flow rates really is.

Specialized TIDALFLUX simulation (as full flow tube simulation)

The IFC 110 PF & SC 100 PF converters may be connected to the GS 8 B for simulation provided that the flow tube level sensing electronics wiring and power is also disconnected at the converter during simulation (forces full pipe condition for the converter on reboot). Use the IFC 110 or SC 100 spreadsheet selection as converter. Be sure to power down the converter whenever changing the wiring connections.

The basic layout and operation of the "**Calculator**" and "**Calculator + Zero Compensation**" sheets are essentially the same.

Record printing

A pre-formatted test record may be printed individually for each worksheet as tests are completed. The test worksheet fields for; date Recorded, Serial #, Tag #, Flow Tube, Commission Number and Tested By should be complete to provide an individual test record identification. Use computer operating system print preview/print menu facilities to view/select printer as available. The actual print date and worksheet type will also be included as part of the record printout.

If there are any additional questions, please contact your local KROHNE representative or Tech Support at KROHNE, Inc.