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GREAT PLAINS INDUSTRIES, INC.

"A Great Plains Ventures Subsidiary"

09 Series Computer Configuration Document

Factory and Field Calibration Curves

GPI 09 series flow computers have enhanced calibration features. All calibration information is visible to the user as words in the upper part of the display, above the numeric digits.

All units are configured with a factory calibration curve, for which units of gallons or liters may be selected by the user (GAL or LTR will be visible). This curve is NOT user adjustable: the word PRESET is displayed to show this. The factory calibration is stored permanently in the computer's memory.

The field calibration curve(s) may be set by the user, and changed or modified at any time using the calibration procedure described below in the CALIBRATION section. The flowrate or totals derived from the field calibration are visible when the field calibration setting is selected (CAL B or CAL C will be visible).

USER CONFIGURATION

The new 09 series GPI flow computer has been programmed with many additional features, most of which can be enabled by the end user by way of a configuration process. By disabling unnecessary features, day-to-day flowmeter operation can be greatly simplified, making the unit easier to use. Alternately, there are several features that GPI disables by default when shipping standard meters (for example, K-Factor Entry Field Calibration, described below). For more advanced users, it may be desirable to enable ALL possible features. User configurable features include

Totalizers/Modes Enabled (Cumulative Total, Batch 1 Total, Batch 2 Total, Flowrate Mode)

Flowrate Update Interval (Units per Minute, Hour, or Day)

Primary Factory Calibration Curve Status (Curve A Units (Gallons or Imp. Gallons) and Resolution (0, 1 or 2 Decimals))

Alternate Factory Calibration Curve Status (Curve A Units (Liters) and Resolution (0, 1 or 2 Decimals))

User (Field) Calibration Curve Status (Enable or Disable Cal Curve (B or C) and Calibration Method (Dispense/Display or K-Factor Entry))

Maximum Resolution for User (Field) Calibration (0, 1 or 2 Decimals)

Models That Allow End User Configuration

- G2 Local Registry Displays
 - Example: G2S10N09NB1
- G2 Remote Transmitters
 - Example: G2S10N31GMC
 - Example: G2X10X32GMC
 - Example: G2X07X40GMC
 - Example: G2X10X41GMC
 - Example: G2X10X42GMC
- Remote GM Transmitters (GX5 00)
 - Example GX5 00-1
- Local Registry GM Displays (GG5 00)

- Example GG5 00-1
- A1 series
 - A109GMA100NA1

Models That Do Not Allow End User Configuration

- FM300 series
- 01 series
- 03 series

Changing Configuration Settings

Access to the configuration process is non-obvious for security reasons, and is inhibited until a password is entered. Configurations are entered and stored as six-digit codes where each digit represents a setting for one of the configuration options. New configuration settings are stored in the computer's long-term memory and will not be lost either in the OFF mode or during battery change.

Since there are security timeouts associated with the configuration-changing process, you should determine ahead of time what your new six-digit configuration code will be. Using the [09 Series Configuration Code Calculator](#) on this website, create the new code and then write it down so you may refer to it during configuration.

To change configuration settings, follow these instructions exactly! The process will require you to temporarily disconnect power. (For most GPI meters this means temporarily disconnecting the battery.)

- a. Temporarily disconnect power to the flow computer (On units with two batteries, only one needs to be disconnected. On remote units or others that are externally powered, temporarily disconnect power at any convenient point).
- b. Allow at least 30 seconds before proceeding to allow all internal capacitance to discharge.
- c. While the unit is still unpowered, press and hold both buttons. While holding both buttons, re-apply power. Keep both buttons pressed for about one second after applying power, then release them.
- d. If you have done this correctly, the display should immediately show 000000 with the left-hand digit blinking. If you do not see this, go back to step (a) and try again.
- e. The computer is waiting for you to enter a valid password (actually a pass-number). The password for all 09 computers is 020748. To enter the number, use the CALIBRATE button to change the blinking digit and/or use the DISPLAY button to shift the blink to the next digit. NOTE: YOU CAN USE THE BUTTONS AS OFTEN AS NECESSARY, BUT YOU ONLY HAVE ABOUT 90 SECONDS TO ENTER THE COMPLETE PASSWORD! As an added security precaution, if a valid password is NOT sensed within 90 seconds, the computer will revert to normal operation, and you will have to repeat the process from step (a).
- f. When the desired number is displayed, briefly press and release BOTH buttons. If you have entered a valid password, the computer will immediately enter its field configuration mode, with the display showing the current six-digit configuration code (for example, 922948). NOTE: ONCE IN CONFIGURATION MODE, THE COMPUTER WILL AUTOMATICALLY REVERT TO NORMAL OPERATION IF NO BUTTON OPERATION IS SENSED FOR 90 SECONDS! If this happens, and you have not completed the process, you will have to repeat the entire process from step (b).
- g. Using the same methods as you used in step (e) above, enter the six-digit code number for your new configuration.
- h. When the correct six-digit code appears, briefly press and release BOTH buttons. The display will briefly show CFGEnd, and then the unit will return to normal operation. Configuration is complete.

Your new settings are stored in the computers long-term memory and will NOT be lost either in sleep mode or during battery change. However, if you are not satisfied with the new settings, you can repeat the configuration process and change any setting as often as desired (Often only a single digit of the six-digit code will need to be changed.).

K-Factor Entry Field Calibration

Presently all GPI computers are programmed with two different field calibration methods, only one of which is active, the dispense-display calibration procedure. It is possible to activate K-Factor Entry Field Calibration by changing configuration settings. K-Factor Entry Calibration allows up to 15 calibration points to be entered using meter K-factor inputs.

K-Factor Entry Field Calibration Procedure

YOUR ACTIONS	NOTES
<p>1. You first need to display a Field (non-PRESET) Calibration Curve. To do so, hold down CALIBRATE while pressing and releasing DISPLAY until the Field Calibration curve appears (CAL B or CAL C message will be displayed). Release both buttons.</p>	<p>Remember that Factory Calibration curves are displayed as GAL PRESET or LTR PRESET. Field Calibration curves are shown as CAL B or CAL C with the PRESET message absent.</p>
<p>2. To calibrate, press and hold the CALIBRATE button. While continuing to hold CALIBRATE, also press and hold the DISPLAY button. Hold both buttons for about three seconds until you see a blinking KF-CAL message. Once the KF-CAL message appears, release both buttons. You are now in K-Factor input mode.</p>	<p>This step puts the unit in K-factor input mode (KF-CAL).</p>
<p>3. Once you release the buttons, the display will show the blinking message KF 01 (or KF 02, KF 03, etc. if you are repeating this step).</p>	<p>The computer is waiting for you to make a decision to either enter a k-factor or exit calibration. If you want to exit the calibration now, go to Step 11.</p>
<p>4. If you want to continue with the calibration, press either button briefly and release it.</p>	<p>It is possible to set up to 15 cal-curve points, and the KF ## and Pr ## messages will increment each time you repeat the calibration process (KF 01, Pr 01, KF 02, Pr 02, KF 03, Pr 03 etc. up to KF 15, Pr 15).</p>
<p>5. After you have released one of the buttons, the display will change to a numeric representation of the old K-factor for this point (for example 005 64.0) with the left-hand digit blinking. Enter the k-factor of the new cal point. When you are finished, press both buttons briefly and release.</p>	<p>NOTE: K-factors are entered as number of pulses per unit measure (for example, pulses per gallon). To enter numbers use the CALIBRATE button to change the value of the digit that is blinking and use the DISPLAY button to shift the blink to the next digit.</p>
<p>6. Once you release the buttons, the display will show the blinking message Pr 01 (or Pr 02, Pr 03, etc. if you are repeating this step). Press either button briefly and release it.</p>	<p>The computer is waiting for you to enter a pulse rate. Pulse rates are entered as pulses per second. NOTE: If you have elected to enter a single K-factor, you must still enter a pulse rate for this K-factor (any value will work), otherwise you will receive an Error message.</p>
<p>7. After you have released one of the buttons, the display will change to a numeric representation of the old pulse rate for this point (for example 00047.1) with the left-hand digit blinking. Enter the pulse rate of the new cal point.</p>	<p>To enter numbers use the CALIBRATE button to change the value of the digit that is blinking and use the DISPLAY button to shift the blink to the next digit.</p>
<p>8. Once the correct number has been entered, press both buttons, and the display will show a KF CAL</p>	<p>You have installed the new cal-curve point. You are ready to end calibration (Step 10) or enter another</p>

<p>message. When you release the buttons, the display will change to a blinking KF 02 (or greater) message. At this point, the computer is reminding you that the next value to be entered will be a K-factor.</p>	<p>new calibration point (Step 9).</p>
<p>9. To enter another calibration point go back and repeat Steps 3 through 8.</p>	
<p>10. To end calibration, press and hold both buttons for about three seconds until you see the CALEnd message.</p>	<p>After you release the buttons, the computer will resume normal operations with the new cal point(s) active.</p>
<p>11. If you have NOT entered a K-factor, you can exit calibration without changing the CAL curve. If the message KF 01 is showing and you have not entered a K-factor, hold both buttons for about three seconds until you see a CALEnd message, then release.</p>	<p>After you release the buttons, the computer will resume normal operation and the old curve (if you have entered one in the past) is still intact.</p>