

Rapidlogger Systems

Variable Settings for Cementing on Rapidlogger Units

This tech note describes the default variable list for Cementing Setup on the Rapidlogger units and the method by which these variables can be calculated for cementing equipment with different type of sensors and different pressure and different pump displacements. The proffered method for modifying the Rapidlogger Variable settings is by using the Rapidlogger Utility PC program. This program runs on a PC and communicates with the Rapidlogger panel over an Ethernet (network) connection. For details on the use of this utility please refer to Rapidlogger Tech note #4.

#	Variable Name	Units	Variable Type	Input Number	Input Variable		Multiplier	Offset
					#1	#2		
1	Pressure	psi	Analog	1	-	-	0.28610660	-3750
2	Density	ppg	Analog	2	-	-	0.000267029	4.5
3	TotalVolume	bbl	Calculated Sum	-	8	9	-	-
4	TotalRate	bpm	Calculated Sum	-	5	6	-	-
5	Pump1Rate	bpm	Frequency	1	-	-	0.012900000	-
6	Pump2Rate	bpm	Frequency	2	-	-	0.012900000	-
7	Pressure2	psi	Analog	3	-	-	0.286106600	-3750
8	Pump1Total	bbl	Frequency Total	1	-	-	0.000215000	0.0
9	Pump2Total	bbl	Frequency Total	2	-	-	0.000215000	0.0

Table 1: Default Variable Setting

Description of variables and Default Settings

Variable 1: The name of this variable is Pressure; its units are PSI (Pounds Per Square Inch). It is acquired from analog input number 1. It has a multiplier of 0.28610660 and an offset of -3750. This is meant to be used for a 15000 PSI pressure transducer with 4-20mA outputs. Where 4mA is 0 PSI and 20mA is 15000 PSI. This pressure transducer is attached to the pump on the high pressure side. If a 10000 PSI pressure transducer is to be used in this place then the multiplier would be 0.19073777 and the offset would be -2500.

Variable 2: The name of this variable is Density; its units are PPG (Pounds per Gallon). It is acquired from analog input number 2. It has a multiplier of 0.000267029 and an offset of 4.5. This is meant to be used for reading density from a densitometer with milli Ampere outputs. The 4mA is 8PPG and 20mA represents 22PPG. The densitometer is attached to the pump low pressure side.

Variable 3: The name of this variable is TotalVolume; its units are BBL (Barrels). It is calculated from the sum of the two variables. The two

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variables that it sums are Variable 8 and Variable 9. No multiplication factor is applied to "Calculated Sum" type variables.

Variable 4: The name of this variable is TotalRate; its units are BPM (Barrels Per Minute). It is calculated from the sum of the two variables. The two variables that it sums are Variable 5 and Variable 6. No multiplication factor is applied to "Calculated Sum" type variables.

Variable 5: The name of this variable is Pump1Rate; its units are BPM (Barrels Per Minute). It is acquired from Frequency input number 1. It has a multiplier of 0.0129000, no offset is applied to a Frequency input type variables. This input is meant to be used for with a proximity sensor with pulse outputs. The proximity sensor is attached to the first pump where it can count the number of strokes of the pump. The multiplier is calculated as follows one pulse of the proximity switch is equal to 0.000215 Barrels. Multiple this number by 60 (since there are 60 seconds in one minute, and the pump rate is being calculated as Barrels per minute). The result is 0.0129. The correct multiplication factor for your pump would need to be calculated is the same way. If your pump displacement is 0.05 Barrels and the proximity switch is mounted such that there are 16 pulses per stroke of the pump, then the multiplier would be $0.05/16 \times 60 = 0.1875$.

Variable 6: The name of this variable is Pump2Rate; its units are BPM (Barrels Per Minute). It is acquired from Frequency input number 1. It has a multiplier of 0.0129000, no offset is applied to a Frequency input type variables. This input is meant to be used for with a proximity sensor with pulse outputs. The proximity sensor is attached to the second pump where it can count the number of strokes of the pump. If there is no second pump on the cementing unit then this variable is not used.

Variable 7: The name of this variable is Pressure2; its units are PSI (Pounds Per Square Inch). It is acquired from analog input number 2. It has a multiplier of 0.28610660 and an offset of -3750. This is meant to be used for a 15000 PSI pressure transducer with 4-20mA outputs. Where 4mA is 0 PSI and 20mA is 15000 PSI. This pressure transducer is attached to the second pump on the high pressure side. If there is no separate pressure transducer on the second pump then this variable is not used.

Variable 8: The name of this variable is Pump1Total; its units are BBL (Barrels). It is calculated from the total of the Frequency input number 1. The multiplication factor for this variable is 0.000215. The multiplier is means that one pulse of the proximity switch is equal to 0.000215 Barrels of fluid pumped. The offset value for this variable should be entered as 0. For a different displacement pump the

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Multiplier would be calculated as follows. If your pump displacement is 0.05 Barrels and the proximity switch is mounted such that there are 16 pulses per stroke of the pump, then the multiplier would be $0.05/16 = 0.003125$.

Variable 9: The name of this variable is Pump2Total; its units are BBL (Barrels). It is calculated from the total of the Frequency input number 1. The multiplication factor for this variable is 0.000215. The multiplier is means that one pulse of the proximity switch is equal to 0.000215 Barrels of fluid pumped. The offset value for this variable should be entered as 0. If there is no second pump on the cementing unit then this variable is not used.

Troubleshooting:

1) If after making changes you need to change back to the default settings then just reset the unit setup to the default cementing setup. This can be done as follows

Press F6(Menu) from the main screen on the Rapidlogger panel
Press F6(System) from the next screen on the Rapidlogger panel
Press F4(Setup) from the next screen on the Rapidlogger panel
Press F5(RST) from the next screen on the Rapidlogger panel
Press F1(RstTo Cement) from the next screen on the Rapidlogger panel
Press Enter Key to confirm the reset on the Rapidlogger panel

The unit will now erase all of the modified setting and reset itself to the default Cementing setup as shown in Table 1.

2) Some variables such as Modbus and CAN inputs do not work immediately after setup and require a reboot of the Rapidlogger System. This can be done by powering off the Rapidlogger and powering it back up.