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SLC4000TechNote22_WatlowSettingForCurrentOrVoltageOutput
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SLC4000 Tech Note 22 Watlow Setting For Nominal 4-20 ma Output

Issue: This tech note addresses a very uncommon anomaly where one relay on the SLC4000 is left on when a desired zero command (4.0 ma) has been issued from the Watlow controller. The suspected cause is conducted or induced EMI noise affecting the command wiring to the SLC4000.

This situation can occur when the command line is:

1. Routed with AC wiring
2. Command line wires are not shielded twisted pair.
 - a. The shields are connected to earth ground.
 - b. The shields are terminated at both ends.
 - c. *The recommended shield termination is to the SLC4000 signal common, either TB3 or TB6.*
3. *Quick verification test of 4-20ma signal to determine if the issue is caused by EMI corrupting the command line.*
 - a. *Disconnect the command wires from the Watlow unit.*
 - b. *Disconnect the command line from SLC4000 TB2(+) and TB3(-).*
 - c. *Connect a temporary twisted shielded pair directly between the Watlow*
 - i. *H1 (+)*
 - ii. *F1 (-)*
 - iii. *Shield clipped and left unterminated*
 - d. *Connect the Watlow H1(+) to SLC4000 TB2(+).*
 - e. *Connect the Watlow F1 (-) to SLC4000 TB3(-)*
 - f. *Connect the shield to SLC4000 TB6(-)*
 - g. *Re-test to determine if a step remains ON or any other observed anomalies*
 - i. *If the anomalies do not recur, the issue is most likely EMI coupling into the command wiring. Separate the command line from adjacent AC wiring and re-test.*
 - ii. *If the SLC4000 continues to show anomalies, the unit may be defective. Replace the unit and re-test with the original wiring.*

Possible Work-around Resolution to Improve Command Line Noise Immunity

Change the Watlow EZ-Zone Output Setting

Applicable Models:

1. EZ-Zone PM, Integrated Controller Model
 - a. PM*C*FA****A**
 - ^ Panel Mount 1/8 DIN Vertical
 - ^ PID Controller with Universal Input
 - ^^ Universal Process
 - ^ (A) Standard
2. Example: PM8C1FA-1RAAAAB

Parameters for nominal 4-20 ma Output changed to 3.5ma-20ma

1. Apply power to EZ-Zone
2. Press and hold <Up><Dn> for about 8 sec or until “Set” is displayed in the lower display and “Ai” is displayed in the upper display
3. Press the <Dn> key 4 times or until “otPt” is displayed in the upper display (Step 1)
4. Press<Green o> to enter the menu item (Step 2)

- a. See o.ty in the lower display
 - i. Press <Dn> until “MA” is displayed in the upper display
5. Press<Green o> to enter the next menu item (Step 3)
 - a. See “hEAAt” in the upper display
6. Press<Green o> to enter the next menu item (Step 4)
 - a. See “Fi” in the lower display
7. Press<Green o> to enter the next menu item (Step 5)
 - a. See “S.Lo” in the lower display
 - i. Press <Up> until the upper display reads 3.50 (provides noise margin for nominal 4.00 ma)
8. Press<Green o> to enter the next menu item (Step 6)
 - a. See “S.hi” in the lower display
 - i. Press <Up> until the upper display reads 20.00
9. Press<Green o> to enter the next menu item (Step 7)
 - a. See “r.Lo” in the lower display
 - i. See “0.0” in the upper display
10. Press<Green o> to enter the next menu item (Step 8)
 - a. See “r.hi” in the lower display
 - i. See “100.0” in the upper display
11. Press<Green o> to enter the next menu item (Step 9)
 - a. See o.CA in the lower display
 - i. See “0.0” in the upper display
- 12. Press <infinity> <infinity> to exit to the home page**
- 13. On the SLC4000 master, verify the input configuration DIP Switches 1 through 5 are set for 4-20 ma**
 - a. SW1-1 ON
 - b. SW1-2 OFF
 - c. SW1-3 ON
 - d. SW1-4 OFF
 - e. SW1-5 ON

Output Settings for Nominal 4-20ma

Step	Parameter	Lower Display	Upper Display	Remarks
1	Output		otPt	
2	Output Type	o.ty	MA	
3	Mode	Fn	hEAAt	
4	Function	F1	1	
5	Scale Low	S.L0	3.50	Changed to provide added noise immunity
6	Scale High	S.hi	20.00	
7	Range.Lo	R.Lo	0.0	
8	Range.High	R.HI	100.0	
9	Lo Calibration	Lo.CA	0.0 %	

Optional – Output Parameters for nominal 0-10V/2-10V Output

1. *If the Watlow unit is configured for 4-20 ma, on the Watlow terminal board, change the (+) lead from H1 to G1.*
2. Apply power to EZ-Zone
3. Press and hold <Up><Dn> for about 8 sec or until “Set” is displayed in the lower display and “Ai” is displayed in the upper display
4. Press the <Dn> key 4 times or until “otPt” is displayed in the upper display (Step 1)
5. Press<Green o> to enter the menu item (Step 2)
 - a. See o.ty in the lower display
 - i. Press <Dn> until “volt” is displayed in the upper display
6. Press<Green o> to enter the next menu item (Step 3)

- a. See “hEAt” in the upper display
7. Press<Green o> to enter the next menu item (Step 4)
 - a. See “Fi” in the lower display
8. Press<Green o> to enter the next menu item (Step 5)
 - a. See “S.Lo” in the lower display
 - i. Press <Up> or <Dn> until the upper display reads 0.00 for 0-10V or 2.00 for 2-10V
9. Press<Green o> to enter the next menu item (Step 6)
 - a. See “S.hi” in the lower display
 - i. Press <Up> or <Dn> until the upper display reads 10.00
10. Press<Green o> to enter the next menu item (Step 7)
 - a. See “r.Lo” in the lower display
 - i. See “0.0” in the upper display
11. Press<Green o> to enter the next menu item (Step 8)
 - a. See “r.hi” in the lower display
 - i. See “100.0” in the upper display
12. Press<Green o> to enter the next menu item (Step 9)
 - a. See o.CA in the lower display
 - i. See “0.0” in the upper display
- 13. Press <infinity> <infinity> to exit to the home page**
- 14. On the SLC4000 master, verify the input configuration DIP Switches 1 through 5 are**
 - a. **For 0-10V input**
 - i. SW1-1 OFF
 - ii. SW1-2 ON
 - iii. SW1-3 ON
 - iv. SW1-4 ON
 - v. SW1-5 OFF
 - b. **For 2-10V input**
 - i. SW1-1 OFF
 - ii. SW1-2 ON
 - iii. SW1-3 ON
 - iv. SW1-4 ON
 - v. SW1-5 ON

Output Setting for 0-10V or 2-10V

Step	Parameter	Lower Display	Upper Display	Remarks
1	Output		otPt	
2	Output Type	o.ty	volt	
3	Mode	Fn	hEAt	
4	Function	F1	1	
5	Scale Low	S.L0	0.00 or 2.00	0-10V or 2-10V
6	Scale High	S.hi	10.00	
7	Range.Lo	R.Lo	0.0	
8	Range.High	R.HI	100.0	
9	Lo Calibration	Lo.CA	0.0 %	

Questions? Call or email Selectronix at techsupport@selectronix.us