Here are steps to evaluate the problems you are having with the Hammonds Smart 600 Additive Injector.

1 If possible please perform evaluation steps at low to medium fuel flows (50 to 150 gpm)

2 Make sure control box has “R” in the display window

The “R” value means additive Rate in Parts Per Million.
The Parts per Million value is a calculation of (additive volume divided by product volume) x 1000000

3 The acceptable PPM range has been setup in the PLC to be 1000 to 1500 PPM

When a Prist injected fueling batch is called for (pressing the start button or selecting with the lever switch) the injection control allows 40 seconds for the additive rate to achieve the 1000 to 1500 PPM range.

If the injection rate is not in range after the 40 seconds or if the injection rate falls out of range after 40 seconds, the injection control will indicate a fault by turning the red light on and green light off.

Also, the PPM fault relay is actuated to fault condition when out of range – this relay can be integrated with the truck fueling control, to shut down the fueling pump is the additive rate is out of the specified range. (Most trucks have been setup this way to prevent out of spec fueling)

4 Set truck up for Prist fueling batch – and when ready to fuel, turn Prist control valve to inject and press the start button on Smart 600 control box

5 Watch “R” value display. This value should start low and increase up to approximately 1250 PPM after 30 seconds

1250 PPM is the middle of the specified PPM range and allows for low and high PPM fluctuation differences between low overwing and high single point fueling

6 If fueling is stopped due to injection fault, note the “R” value in the display.

If the “R” value is below 1000 PPM, the injection pump output needs to be increased.
If the “R” value is above 1500 PPM, the injection pump output needs to be decreased

Adjust injection pump output by increasing or decreasing pump stroke setting.

Remember to target 1250 PPM for final injection rate.
Also remember to start new fueling batch each time the pump is adjusted.

6 If the system is injecting at a rate other than “0” but the proper injection rate is not able to be achieved, then mechanical trouble shooting maintenance should be done, i. e. diaphragms, sight flow filter, discharge filter, check valves, etc.

7 If the display injection rate at shutdown shows “R” as “0” value, the 600 fluid motor sensor circuit and the additive meter sensor circuit need to be examined.

8 Open the Smart 600 Injector control box and find the green PLC module that will have “X” and “Y” numbers 0 to 7 with a small LED light beside each number

The “X” inputs and “Y” outputs numbers indicate the following:

X2 Start signal for Prist injected fueling batch (from push button start switch)

X3 Additive injection pulse (from additive meter sensor)

X4 Product flow pulse (from 600 fluid motor sensor)

X6 Selector Valve position (from valve handle sensor)

Y0 Additive Volume High Speed Pulse to Display (same as X3)

Y1 Additive Rate High Speed Pulse to Display (same as PPM value)

Y2 PPM Range Indication, “ON” when in Spec (controls PPM relay and green light)

SCADA Relay (“ON” indicates PPM is out of range and “ON” will turn on Red Light)
This relay is located at the top of the box
PPM Relay (“ON” indicates PPM is in range, led light on relay indicates relay is “ON”)
This relay is located just below the SCADA relay

9 If “0” is present in the display when the system has a shutdown fault, we must determine if the pump is indicating injection from the additive meter sensor “X3”.

Is the “X3” led flashing on the green PLC module when a Prist injection batch is being fueled?

If yes, “X3” is flashing, go to step 12 to analyze product flow sensor

If no, “X3” is not flashing, the injection pump must be checked for output performance. (turn 3 way valve on top of pump to open discharge and catch additive into container. A good output stream should be observed)

If good pump output stream is observed from open discharge, then the additive meter sensor and/or flowmeter rotors must be checked. Go to step 10

10 To check additive meter sensor, remove sensor from flowmeter body and activate by passing magnet closely in front of sensor. “X3” led on PLC will turn on to indicate good sensor. If sensor is good go to step 11 for flowmeter rotor evaluation.

11 To check Flowmeter rotors and Flowmeter body cavity, remove bolts and plate from flowmeter body exposing rotors. Turn rotors very gently and slowly while they are still in body cavity. Does there seem to be a rough spot? If so remove rotors being careful note rotor orientation. Inspect rotor gear teeth for embedded particles and/or rough spots. Clean rotor cavity and replace rotors if required.

12 From step 9, if “X3” additive pulse is flashing, the “X4” product flow sensor must be checked. Does “X4” show a pulse on the LED?

If no pulse on “X4”, is 600 fluid motor turning during fueling? This was verified earlier in step 9 with good output stream from pump. To make sure, remove pump stroke cover and observe shaft/drive bearing revolving

Continuing 12

Fluid motor is turning and no pulse on “X4”, the fluid motor sensor must be checked Remove the product fluid motor sensor from the back of the 600 fluid motor and pass a magnet closely in front of the sensor while observing “X4” on the PLC.