



**STAGE 2 VI PROGRESSIVE DELIVERY  
WATER METHANOL INJECTION**

# **CONTROLLER MANUAL**

## INITIAL SETUP PROCEDURE BASED ON INSTALLED SYSTEMS CONFIGURATION

### **IMPORTANT!**

Controllers that display 'Stage 2', 'Boost Integration' or 'Stage 2 Boost' on the face of the controller are of the V1 variants of which this manual covers. Should you have a controller which carries the 'V2' on the face of the controller please refer to the manual relating to it as this one does not abide by the same operational philosophy and features.

### Indications

The controllers LED indications display the status of the system and are as per the below table:

Indication	Red LED	Green LED	Blue LED
System Ready/ Powered On	●		
Injection Active in Progressive Output Delivery		○	
Injection Active at Maximum Output Delivery			●
Low Pressure Warning	○		
System Failure to Ground Detection	○	○	
Reservoir Low Level Warning			○

### Legend

- Steady Indication
- Flashing Indication

### **1 The Setup**

After installing your system in your vehicle, the first step is to power on the controller and configure it up to suit your systems layout and injection requirements.

It is recommended that the vehicle be driven initially with the new setup with a 50/50 ratio of Water Methanol (approximately 4L Water to 6L Methanol) with the activation setpoint set at (half the settling boost at redline/ 50% throttle) and the Peak setpoint adjusted to the (settling boost at redline/90% throttle).

From there you can alter the injection setpoints earlier whilst assessing the motors tolerance during injection and attempt to activate and reach peak delivery as early as possible or where required.

## **2 Auxiliary Output (Programmed Specifically upon kit order)**

The controller is able to use its output for two functions, put the vehicle into an interlock when an injection fault has been detected or be utilized as a dashboard status led mimic to the controller face LED indications. Upon kit order, the customer can specify which type of output is required as per below

### **2.1 Boost Safe Output (Programmed on request upon kit order)**

The controllers auxiliary output can be wired in a series of ways to provide types of vehicle interlock in order to protect the vehicle from running without active water methanol injection safety.

Please take note that the activation of this safety is fixed in a response time of 4000ms / 4 seconds Failure Time.

### **2.2 Status LED Output (Programmed on request upon kit order) – Default for most**

The auxiliary output can be wired to an external LED that is placed in the drivers view that will indicate via a series of flashes of the systems condition.

This allows for the controller to be placed out of sight in a glove box/ cubby hole.

The indications of the LED are as per the table below:

<b><u>Normal Operation Indications</u></b>	
Slow Flashing	Active Progressive Injection
Steady On	Active Peak Injection
<b><u>Warnings Indications</u></b>	
2 Flashes with a Pause	Reservoir Fluid Level is Low
Fast Flashing	Critical Failure - Check controller LEDS for more information

## **3 The Priming Function**

The system will require to be primed before first time use as the lines are not yet filled (primed) with fluid.

This would also be periodically necessary for vehicles that are not often driven that could have drained lines.

To perform this action, make sure the controller is powered on, press the "Test/Save" button in for longer than 2 seconds but less than 5 seconds to activate the prime feature. If the Prime function is successfully activated this will be indicated by all three LED's flashing simultaneously every second for three seconds and this is to notify the driver that the prime test is about to happen after the 3 second timer expires.

When the prime function activates, the pump will activate at 100% max injection for 3 Seconds and then exit automatically and return to the steady Red LED

The Prime function run time can be overridden manually for a user desired run time for as long as the "Test/ Save" button is held in AFTER the prime function has activated.

#### **4 Saving the Progressive Delivery Setpoints**

Once the controller has been configured in its menu and primed the controller can now be adjusted to suit your vehicles injection requirements. Once set, the controller will never lose its memory even if the setpoints are moved. The first Potentiometer "Activate" refers to the activation point of the system and this will be when the controller delivers its lowest pressure. The second Potentiometer "Peak" refers to the point where the controller will deliver its maximum injection pressure. Between these two adjusted setpoints the controller will interpolate a progressive ramp and vary the pumps output in order to achieve a smooth pressure rise on the output. To save your injection settings, the "Test/Save" button must be held down until the LED's scroll up and down in the following order:

From initially Red to Blue → Green → Red → Green → Blue and returns back to steady Red.

If a new injection point is desired the Potentiometer may be moved and once again the "Test/Save" button be pressed and held until the acceptance flashes are seen.

The values are stored in Non-Volatile memory so even if the controller is unplugged the setpoints will never be lost unless the user chooses to set them in new positions.

#### **5 Internal MAP Sensor Altitude Calibration**

If you have found that the controller is slightly inaccurate on its activation pressure based on the set and saved potentiometers position to a boost gauge, you should calibrate the controllers set altitude.

To calibrate the controller all that is required is for the "Test/Save" button be held down before switching on the vehicles ignition and to keep it pressed in (for around 5 seconds) until the three status LED's on the controller face flash simultaneously three times .

## **6 Warning and Fault Indications**

### **6.1 Low Level Indication - (Slow Flashing Blue LED)**

Should the controller receive an open signal on the from the level monitor the system will wait 5 seconds before indicating a low level alarm by **continuously flashing the blue LED** on the controller face.

Should a normal condition occur, the controller will respond after 5 seconds before deactivating the warning on the controller face.

The time delay is done prevent nuisance reporting of low levels on tanks which experience fluid wash.

### **6.2 System Pressure Low - (Fast Flashing of Red LED)**

When your system experiences a low pressure scenario caused by injection latency or a physical fault on the system, the System Pressure Monitoring will detect this and indicate this condition initially by flashing the Red LED during the system injection indication which would be either Flashing Green (Progressive) or Blue (Peak). Should the system sustain this low pressure condition for longer than 4 seconds the controller will interlock and shut off the injection to prevent the possibility of a fire from forming should a pipe have ruptured.

This condition is indicated via continuous and simultaneous flashing of the **Red LED**.

This interlocked state can be reset by momentarily pressing the "Test/Save" button for less than 2 seconds, and it is advisable that you inspect your system thoroughly as to why it has experienced a prolonged low pressure.

### **6.4 System Hardware Failure – (Alternating Flashing Red & Green LED's)**

Should a critical failure occur internally within the controller or from a wiring issue (such as wearing through a wires insulation and a short to ground), the controller has the ability to detect and prevent this uncontrolled injection which generally leads to a catastrophic event called engine hydro-locking.

The controller is designed to prevent runaway system injection with its 3 stage electrical isolation by interlocking itself.

This feature of the controller is known as the "electrical fail safe" and the controller will indicate this critical failure with a continuous and alternating of the **Red and Green LED's**.

This state cannot be reset or exited for as long as the controller detects the issue.