

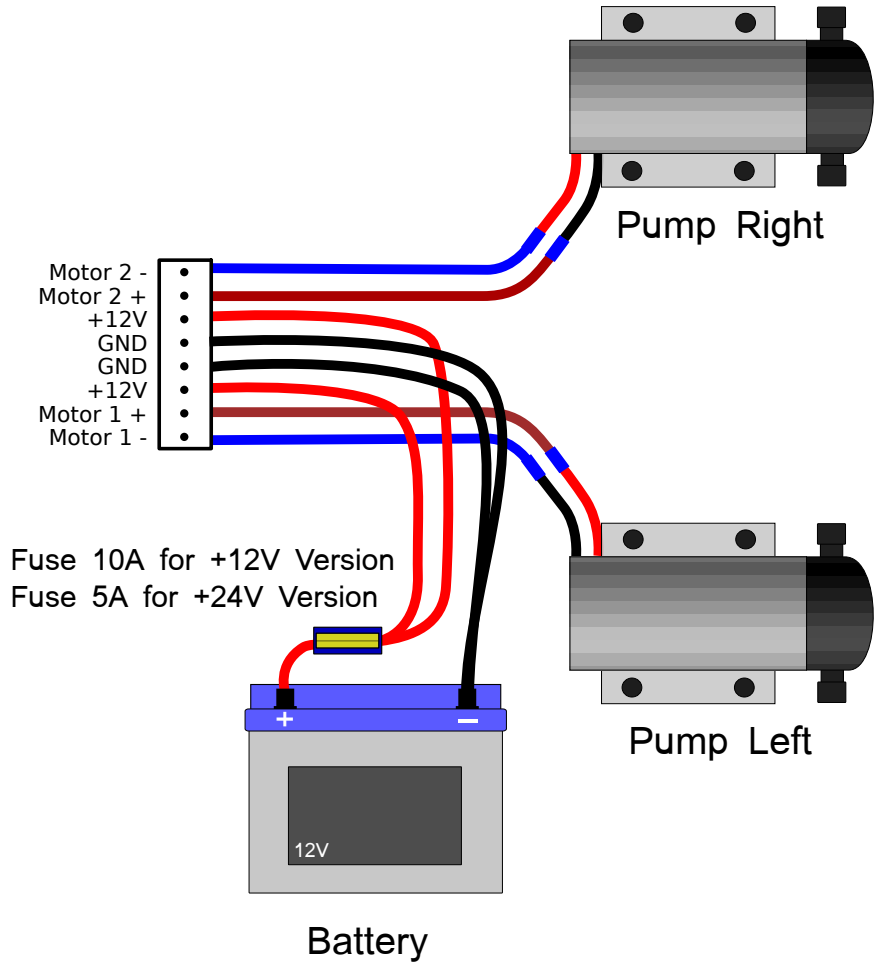
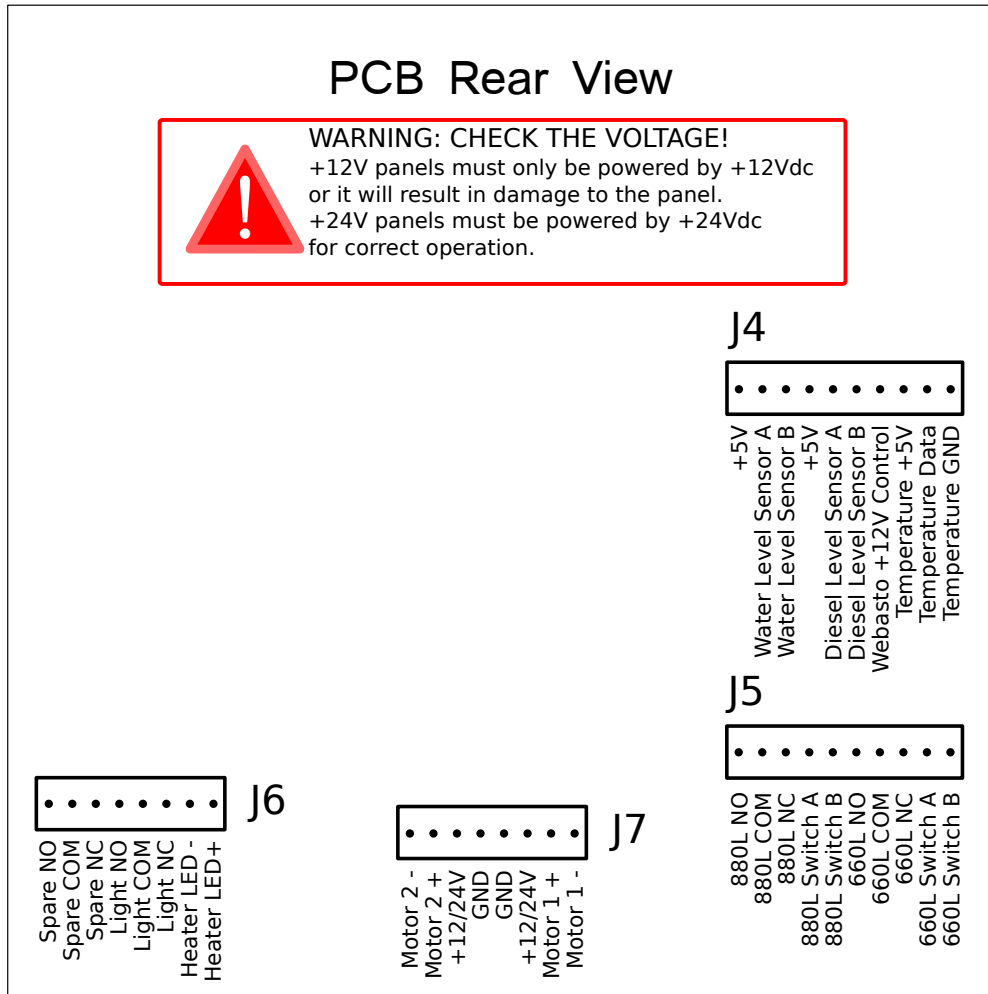
# Step 1. Wiring and Installation



Follow the wiring diagrams carefully. Make sure the push on connectors are aligned correctly.

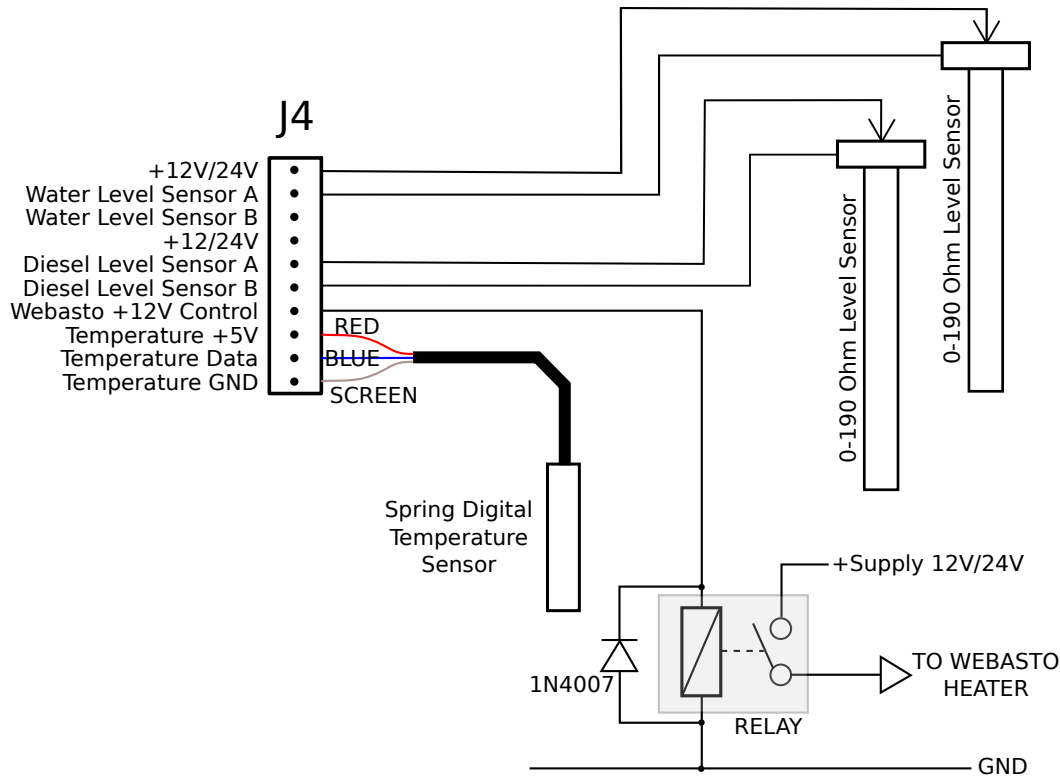
NOTE only fit the fuse once all connections are made. Only apply power when you have checked the installation thoroughly as mis-connection can damage the electronics.

### Step 1.1 Wiring Power and Pumps - J6



Make sure correct fuse is fitted inline. Failure to do so will result in damage to the unit.  
Observe correct battery polarity. Failure to do so will result in damage to the unit.

## Step 1.2 Wiring Level/Temp Sensors - J4



Note: Level sensors are WEMA 0-190 ohms.  
Resolution is determined by sensor length.  
500mm Sensor = 23 Steps  
600mm Sensor = 27 Steps

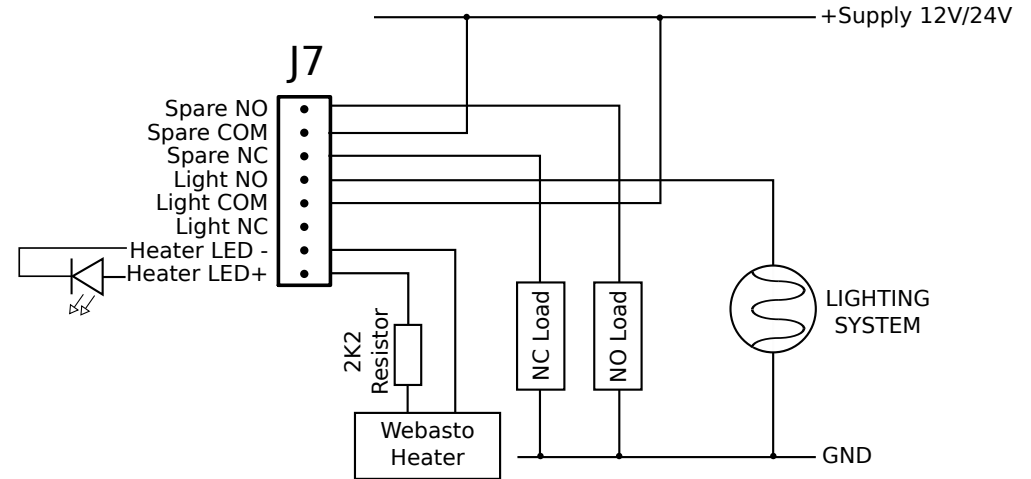
Temperature Sensor Accuracy = +/-0.5 Deg C



Webasto +12V/+24V Control drives a +12V (or +24V relay).  
Ensure 1N4007 (or similar) is fitted to protect the PCB.

Webasto +12V/+24V Control has a max power dissipation  
of 1.9W. Current should be limited to under 500mA

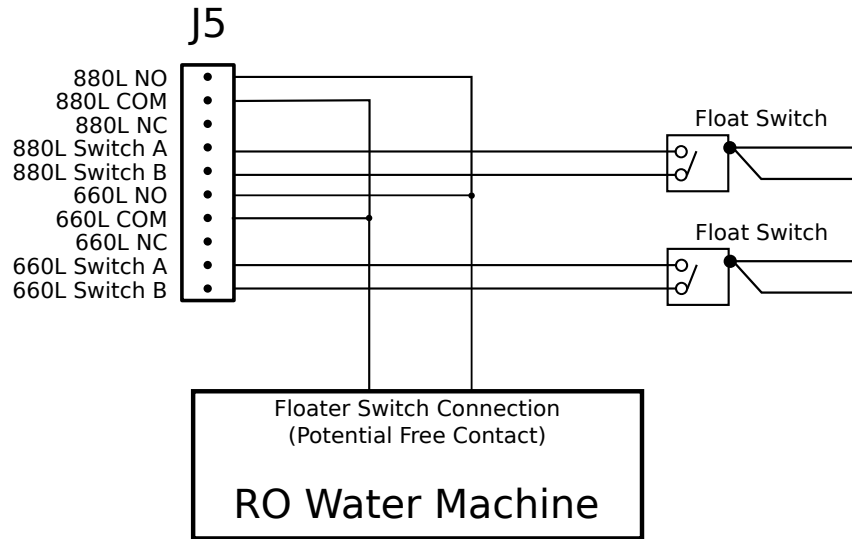
## Step 1.3 Wiring Lights/Spare/Heater LED - J7



Note: All relays have NO (normally open) and NC (normally closed) contacts. COM is the common contact.

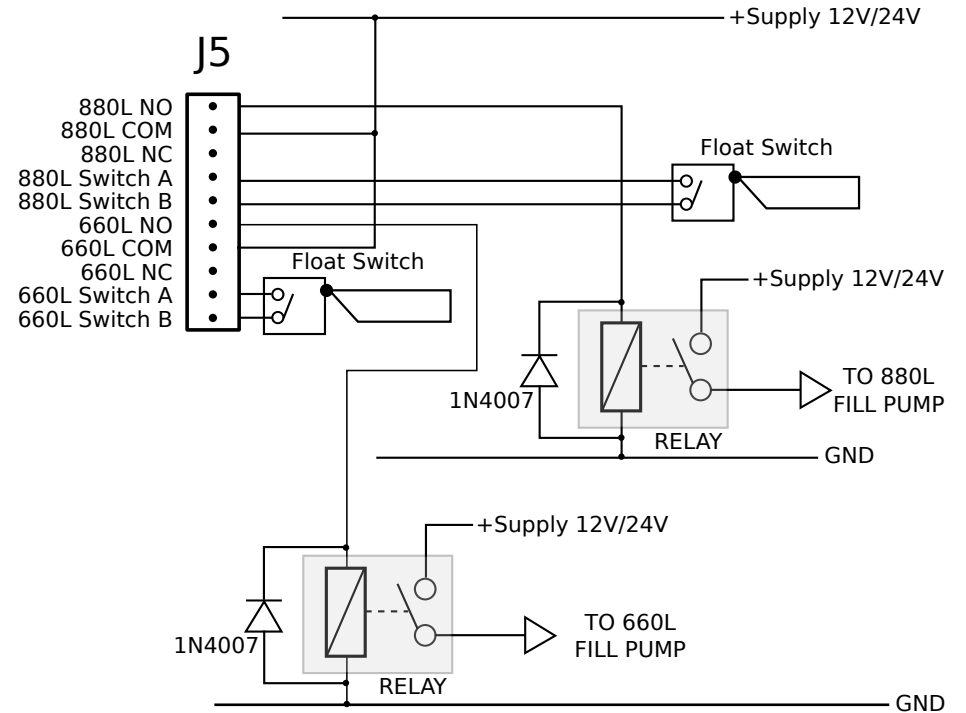
+12V relays can switch loads of 10A +12Vdc (non inductive)  
+24V relays can switch loads of 7A +24Vdc (non inductive)

## Step 1.4 Wiring Aqua Force - J5 Connection to RO Water Machine



Alternatively if 'Pump Relay Override' on the GUI is set to 'on' then the 660L will operate for both 660L and 880L level switches. The 880L relay will operate independently and be activated/de-activated by the RIGHT pump control '0/1' button.

## Connection without RO Water Machine



The 880L and 660L can be wired in parallel if required.

## Step 2. Panel Controls - Quick Guide

See the panel diagram opposite.

**PUMP LEFT:** Is the MOTOR 1 (J6) control. Set between 100-200 litres per hour.

**VOLTAGE:** Is the supply voltage in volts.

**PUMP RIGHT:** Is the MOTOR 2 (J6) control. Set between 100-200 litres per hour.

**WATER TANK:** Is the water level in litres.

**TEMP - TANK:** Is the heater control. Turn on/off with '0/1' button. Set temperature required up/down with arrow buttons. Temperature is displayed in degrees celcius.

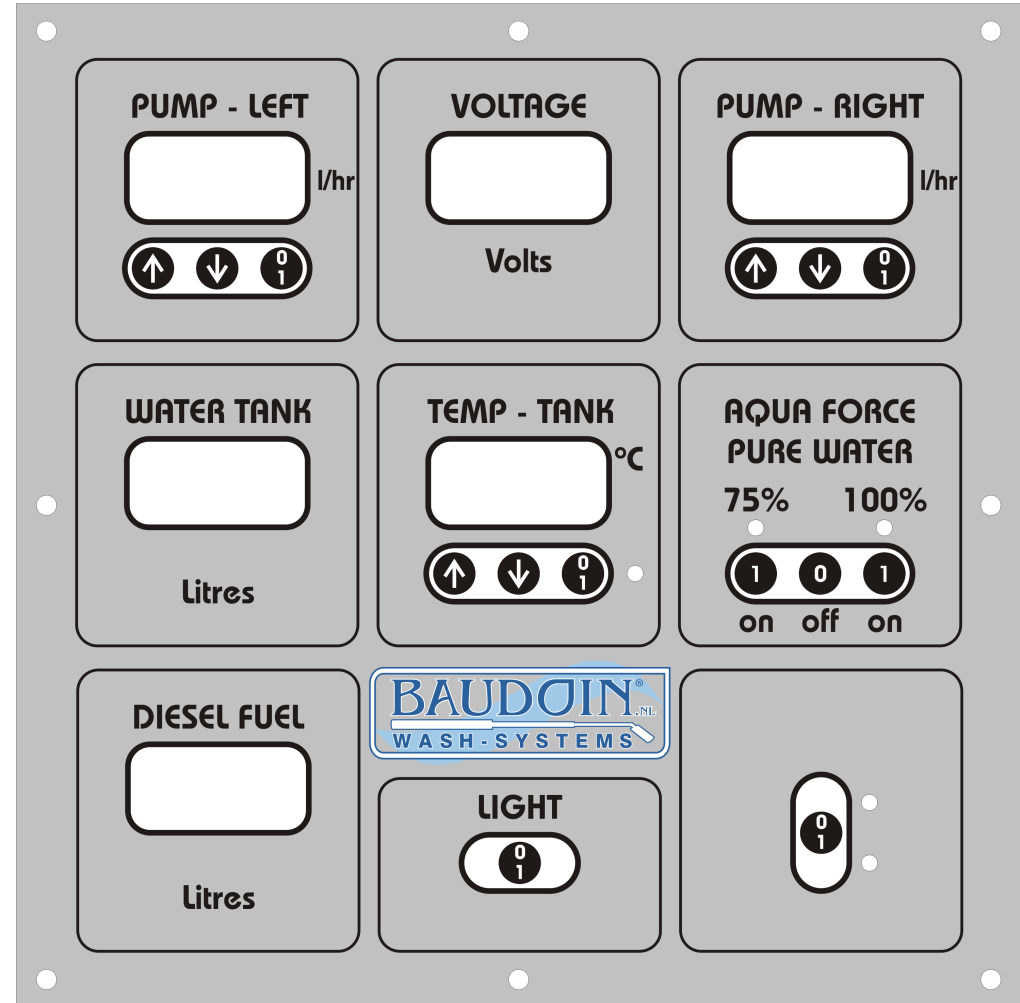
**AQUA FORCE PURE WATER:** Is the level controller. To fill to the 75% level press the 75% button. To fill to the 100% level press the 100% button. Note: Unit tries to maintain the required level once activated. To de-activate the fill and level control press the central '0' button.

**DIESEL FUEL:** Is the diesel level in litres.

**LIGHT:** Toggles the LIGHT output relay on or off. Press once for on then once for off.

**SPARE:** Is the bottom right hand button. This toggles the SPARE output relay. Press once for on and then once for off.

### Step 2. Panel Controls Cont'd



### Step 3. Set Up - Pump Calibration

Connect your hose and brush to the pump.

Turn on the controller by pressing the on/off button.  
The display LED will turn on and show a value between 100 and 200, this is the pump flowrate in litres/hour. e.g.



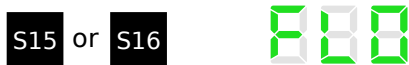
Press the calibration button on the rear of the panel to go into calibration (S15 for LEFT and S16 for RIGHT).



Adjust the calibration value with the up/down buttons, until the 'dE' message has stopped and you have continuous water flow from the pole.



When you are happy that the calibration value is correct, press the calibration button on the rear again to save the calibration value.



### Step 4. Use - Pumps

Press on/off button to turn on the controller (LEFT or RIGHT) and this will turn on the pump (LEFT or RIGHT).






Press up or down button to adjust to the desired flowrate between 100 and 200 litres/hour.



To turn the pump off completely press the on/off button and the display will turn off and the pump will stop.



Message	Description
	Pressure switch activated or motor disconnected.
	A dead end has been detected. If this is not the case, try increasing the Cal value.
	This message will start to flash in the voltage display when the battery is low (<10.0V). If battery is below 9.0V the pumps and heater will be disabled to protect the battery.

## Step 4.7. Use - Heater Control

To turn the heater control on press the '0/1' button. If the heater control is on then the display will blink a decimal place (dot) in the right hand bottom corner of the display.



To adjust the required water temperature press the up or down arrows. The display will show the following.



Then the display will show the current set temperature. This is your setpoint or required temperature. Adjust to the value required. After a few seconds the display will show.



This tells the user that the display is going to go back to indicating the actual or measured temperature.

Note: The LED to the right of the '0/1' button is the Webasto Diagnostic LED and this indicates the status of the Webasto with different flash codes. Please see your Webasto manual for more details.

**CAUTION:** Always wire the LED in series with a volt drop resistor.

## Step 4.8 Use - SELF TEST MODE

The panel comes with a built in self test mode.

1. Set the Water Tank and Diesel Tank with the GUI to 100
2. Connect the unit test box to the panel under test. Take care to connect the terminal blocks to the right connectors and align carefully.
3. Apply power to the test box. Ensure voltage is exactly +12V for the +12V version or exactly +24V to the +24V version.
4. Set Water Tank and Diesel Fuel to 46 (using the pots on the test box).
5. Turn off the unit power.
6. Press and hold BOTH calibration buttons on the rear of the panel (S15 and S16) and then apply power up the panel.
7. The unit comes up in self test. All displays will be '000'.
8. Press each button in turn from top left to right and then down the panel.
9. The display value will update as follows:  
000, 011, 022, 033, 044, 055, 066, 077, 088 top buttons.  
099, 111, 222, 333, 444, 555 middle buttons.  
666, 000 bottom buttons.
10. When the last switch is pressed (SPARE) then the relays will cycle through a self test. If there is a problem then the panel will display an error code in the PUMP LEFT display.

## Step 4.8 Use - SELF TEST MODE Cont'd

The error codes and their meanings are as follows:

E01 - Incorrect supply voltage, check PSU is either +12V or +24V (as required by version) exactly.

E02 - EEPROM failed write/read cycle. The panel will not be able to save its own settings.

E03 - Incorrect temperature reading, if second display shows 99.9 then it is likely temperature probe is not fitted.

E04 - Water level sensor not working, check test jig is connected and value is set to 46 (by adjusting the water level pot)

E05 - Diesel level sensor not working, check test jig is connected and value is set to 46 (by adjusting the diesel level pot)

## Step 5. Use - GUI (Graphical User Interface)

The unit is supplied with a GUI to allow engineers to configure the panel settings.

### Installation

Double click on the file: BADUI.exe

Follow the instructions on screen. If you would like a desktop icon then click on the tick box and one will be created.

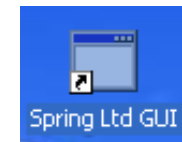
When Windows gives the:

'New Hardware Detected' message you must install the driver file. This can be found in the following folder:

C:\Program Files\Baudoin UI v1.1\Windows Driver

You will need to tell Windows to go to this specific location for the driver.

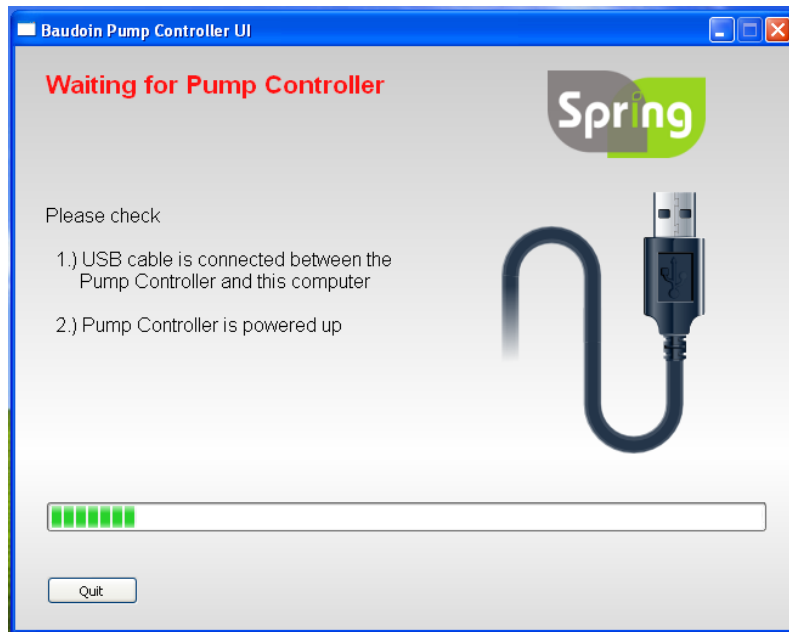
To start the Spring Ltd GUI simply click on the desktop icon called 'Spring Ltd GUI'



or select from 'START' and 'All Programs'.

## Step 5. Use - GUI Cont'd

When the software starts you will see the following dialogue box.

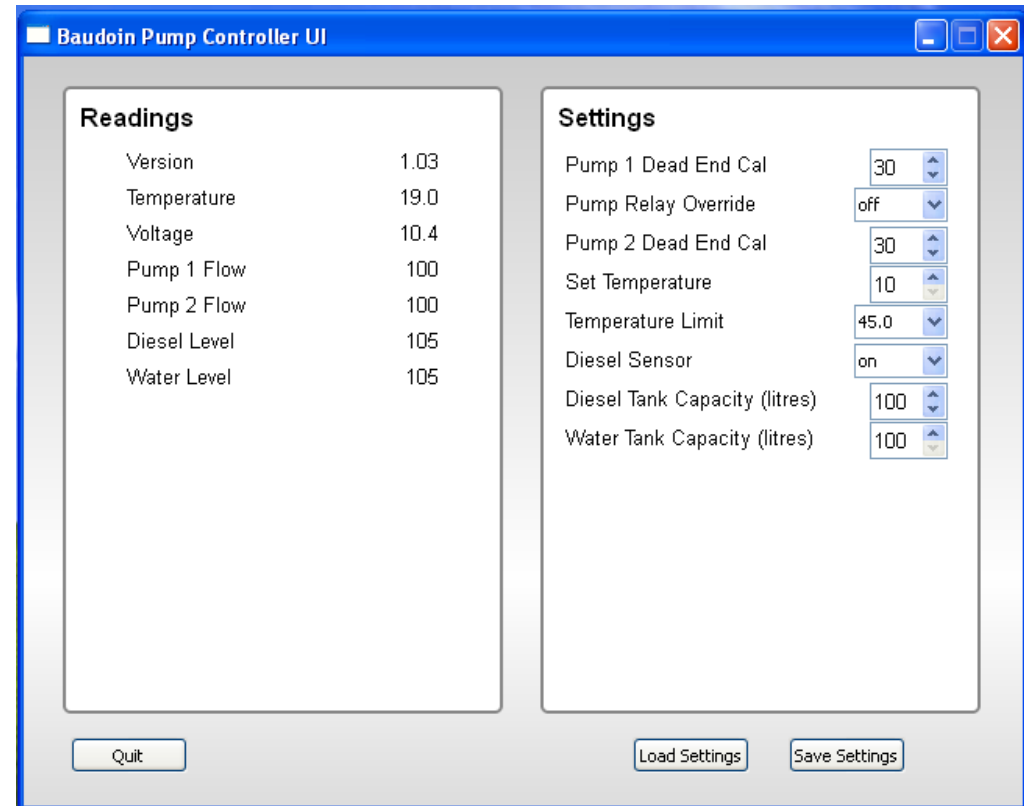


Ensure that:

1. The USB lead is connected from your PC to the USB connector on the rear of the panel.
2. The panel must be powered.

## Step 5.1 Use - GUI Settings

When the GUI has successfully connected to the panel, you will see the following dialogue box.



This dialogue allows you to read the information from the panel and set the configuration settings on the panel.



## Step 5.1 Use - GUI Settings Cont'd

### Readings

On the left side the information can only be read from the panel. The data displayed is as follows:

Version: This is the software version in the panel.

Temperature: The temperature being read by the temperature sensor connected to the panel.

Voltage: The power supply voltage to the panel

Pump 1 Flow: The left hand pump flow setting. This should be 100-200.

Pump 2 Flow: The right hand pump flow setting. This should be 100-200.

Diesel Level: The level being read in the diesel tank (if sensor fitted)

Water Level: The level being read in the water tank.

### Settings

On the right side the parameters can be set as required for the application.

Pump 1 Dead End Cal: This is the sensitivity of the LEFT pump control to when the water is stopped (dead ended) at the pole by the user operating the pole valve.

Typically this is set to 75 for Baudoin systems, but this will vary from project to project.

Remember: Set this value too low and the pump will cycle on and off and you will not get constant flow.

Set this value too high and it will take longer for the pump control to shut down when the user stops the water at the pole.

Pump Relay Override: Set to 'off' if the RIGHT pump control is to operate normally and drive a DC pump.

Set to 'on' if the panel is to control an AC pump by changing the way the RIGHT pump control works:

If set to 'on' when you turn RIGHT pump control on with '0/1' button the display will show '100' and the unit will activate the 880L relay. Press '0/1' again and the display will go off and the 880L relay will deactivate. In this way you can use the relay to control an AC pump via an external AC relay.

NOTE: 660L relay now operates on Aquaforce for both 660L and 880L level switch inputs.

Pump 2 Dead End Cal: Same operation as for Pump 1 but for the RIGHT pump control.

Set Temperature: The desired temperature of your heated water.

Temperature Limit: The maximum or 'safety' temperature that the system will be allowed to reach. It is not possible to set the 'Set Temperature' higher than the 'Temperature Limit'

## Step 5.1 Use - GUI Settings Cont'd

### Settings Cont'd

Diesel Sensor: Set to 'on' if you want to connect a diesel sensor to the panel.

Diesel Tank Capacity (litres): Set this to the volume of your diesel tank. If the diesel level drops to 5 or below, the panel will display 'Lo' and disable the heater. Set to 'off' to turn off the diesel display and turn off the diesel sensor input.

The sensor input is designed for WEMA 0-190 ohm sensors.

Water Tank Capacity (litres): Set this to the volume of your diesel tank. If the water level drops to 5 or below, the panel will display 'Lo' and disable the heater and the pumps. Set to 'off' to turn off the diesel display and turn off the diesel sensor input.

The sensor input is designed for WEMA 0-190 ohm sensors.

### Save Settings

Click on 'Save Settings' to save the current panel configuration to a file for your records.

### Load Settings

Click on 'Load Settings' to restore the previous panel configurations from a file (created with 'Save Settings')



## Operating Warnings

Adjust your flow settings carefully. Repeated false dead-end detection indicates that the Cal value should be increased (less sensitive).

For absolute safety always wire through the pump pressure switch. (The pressure switch can be bypassed if absolutely necessary - the unit will protect itself under normal conditions.)

This is a WATER PUMP controller: it will not work with air in the system. Always prime your system before starting work. If air in the system causes false dead-end detection, increase Cal value (less sensitive).

Do not set the Cal value too high. Setting it higher than necessary places extra strain on both the pump and the controller in a dead end situation. This can result in damage to both the pump and your controller.

Specification	Value
Supply Voltage 12V Version	10 - 15 VDC
Supply Voltage 24V Version	22 - 26 VDC
Maximum Current (12V/24V)	10A/6A
Typical Drive Current	4-5A
Voltmeter Accuracy	+/- 200mV
Enclosure Material	Polyester coated composite
Water Resistance	IP65 (on front face only)
Dimensions	250 x 250 x 50(mm)
Working Temperature	0 to 40 Deg C

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