—MODEL— CPC

4-20 mA Actuated Position Control

Thank you for purchasing a CLA-VAL CPC. With appropriate care, this CPC will provide accurate and reliable control of your valve for many years. The CPC is built with the latest technology using only very high quality components.
The CPC is a 4-20 mA standalone actuated control which is PC calibrated and able to remotely control any CLA-VAL valve. The pilot setting can be adjusted with a standard 4-20 mA signal. It also incorporates a 4-20 mA position feedback signal to cross check if the requested position is reached.

General Disclaimer

In accordance with our policy of continuous development and improvement, CLA-VAL reserves the right to modify or improve these products at any time without prior notice. CLA-VAL assumes no liability or responsibility for any errors or omissions in the content of this document.

Please review this manual thoroughly before starting

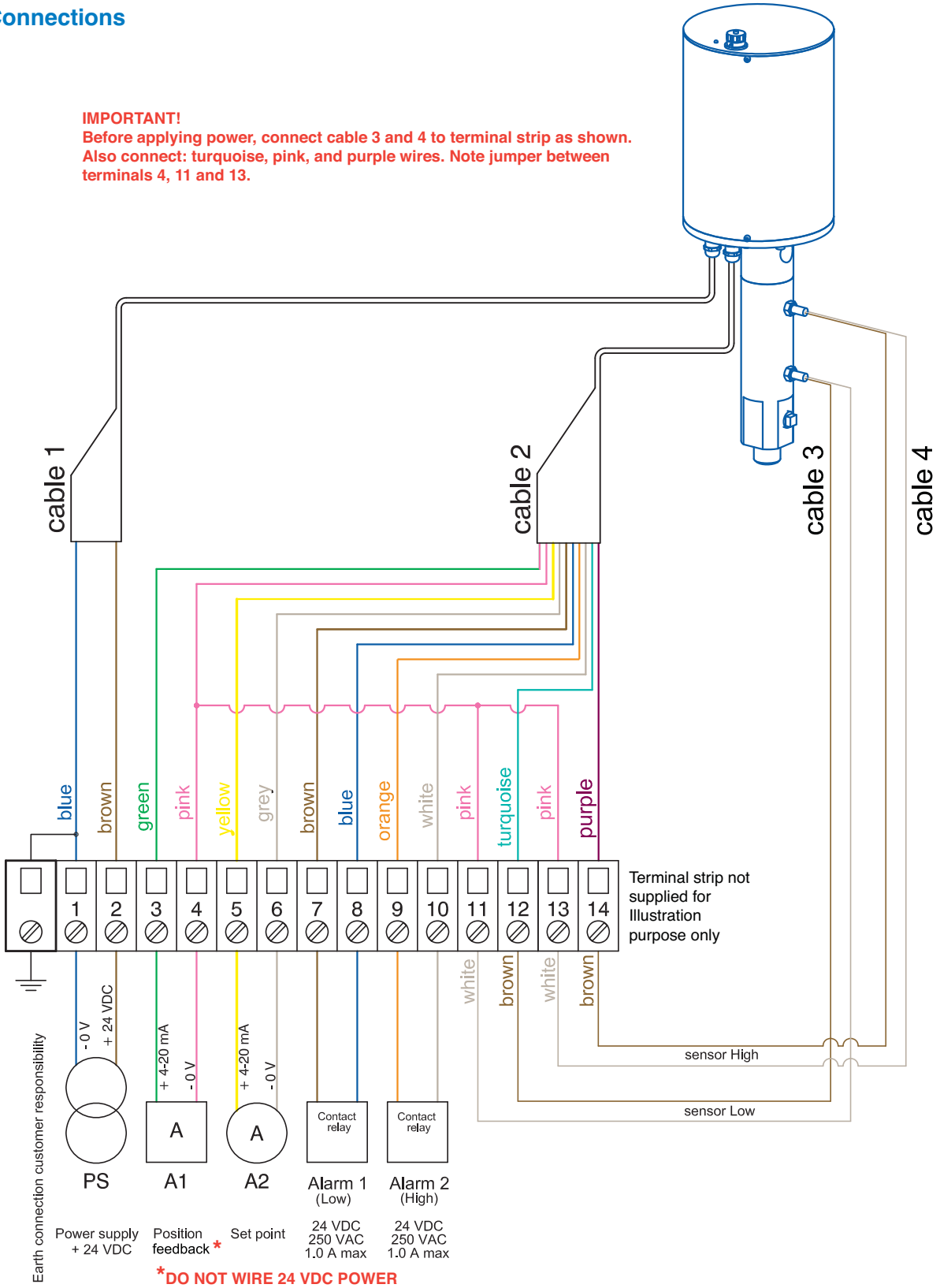
1. Visit our internet address and, if necessary, update the CPC with the latest Software and Firmware versions.
2. Troubleshooting at start up (after wiring actuator and applying 24 VDC power).
   a. View LED diagnostics located on top of actuator.
   b. At start-up, the LED should remain red for 5 seconds than turn to solid Green
   c. Green - OK normal status.
   d. No light - Check power supply.
   e. Red - High torque limit probably exceeded Power down and up again. Excess voltage (above 32 volts).
3. Blinking red/green
   a. Calibration was not completed correctly recalibrate.

CPC

Maintenance cable

CPC Series Actuator Wiring Diagram

Wiring Connections



Download Wiring Diagram from website:
(www.cla-val.com)

Electrical Specifications

Electrical Power:
- 24 VDC, 6 / 10 / 15 rpm / sizes
  300 mA max. load draw
  85 mA stand-by (no load draw)

Power Protection:
- Max. 32 VDC over voltage
  Max. 1000 mA torque load
  Reverse polarity & short circuit
  80°C stop @ high temperature

Led Display:
- Green LED

Electrical Connection:
- 2 x Moulded 10 m cables

Power Supply:
- 24 VDC +/- 10%, min. 20 mA, normal 60 mA, max. 1 A

Input Command:
- 4-20 mA (2 wires)
- 2 x dry contact (manual positioning)

Input 4-20 mA Protection:
- Max. 32 VDC over voltage
  Optocoupler isolation @ CMR 100 V
  (CMR: common mode rejection)
  Insulated (2 wires)

Output feedback:
- 4-20 mA (Output charge ≤ 500 Ω
- 2 x programmable position alarms

Output 4-20 mA Protection:
- Max. 32 VDC over voltage
  (The input dry contact and 4-20 mA output have the same common or earth but are not individually Isolated

Other Specifications

Operating Pressure: PN 16 bar standard

Operation Type: Continuous Control

Operating Temperature Range: -10°C to +80°C

Protection: IP68 standard allowing full immersion (solenoid, junction box, sensor, not included in IP68)

Interface: Plug & Play / NT / 2000 / XP / Vista

Default Mode

Troubleshooting:
Refer to user manual for Led diagnostics (red-green-blinking)

Remote Command Failure:
Options available: maintain current position, go to 4 mA position, go to 20 mA position

Installation Instructions

3. The CPC should be mounted in the vertical position.
4. All installation, adjustment and maintenance should be carried out by a competent electrician.
5. Do not exceed the maximum ratings given in the specifications and printed on the label.
6. The electrical connections should be made as described in the user's manual.
7. Before any maintenance operation the main power should be turned off.

⚠ Do not attempt to open the product as this will invalidate the warranty!

Software / Firmware Updates

For Software updates please visit our web site at **www.cla-val.com**:

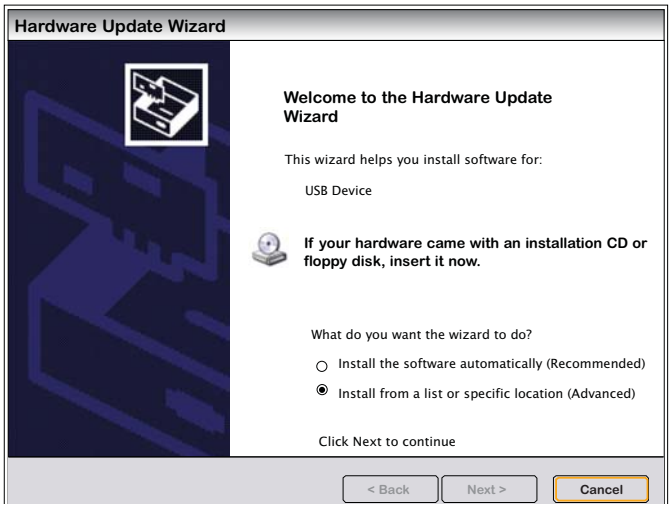
1. Select "**Actuators and Controls**" to find the latest Software (PC) & Firmware (actuator internal software) updates.
2. Follow instructions to download automatically.
3. All the software is multi-language. Only the installation Software is in French or English.

Firmware Update (Actuator internal Software)

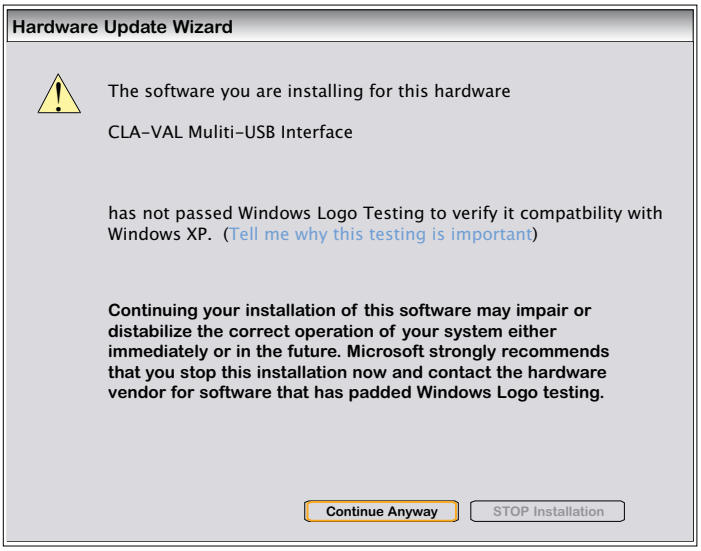
1. Before updating the Firmware, save program to laptop.
2. Connect the USB cable to the USB connection on laptop.
3. Connect the CPC to the USB cable.
4. Select "**Read Parameters**" to read CPC settings and record output parameters.
5. Select "Firmware update" in "Parameters".
6. Open the corresponding "**.hex**" file.
7. Select "**Read Parameters**" to check that the Firmware has been updated.

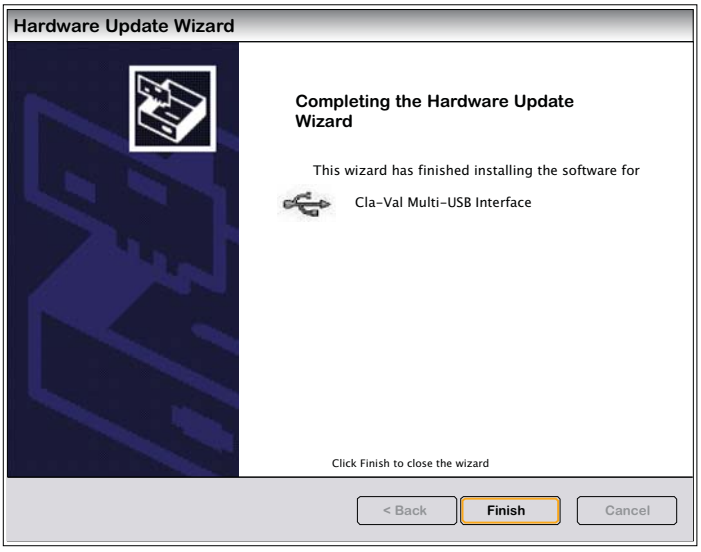
USB Driver Installation

When the CPC cable is connected the first time, the laptop will detect it and request a driver.



Select "**Cancel**".
Install the "Multi-USB driver setup" software on your PC (you can download this software from the internet **www.cla-val.com**).
When you see this message below, select "**Continue Anyway**".

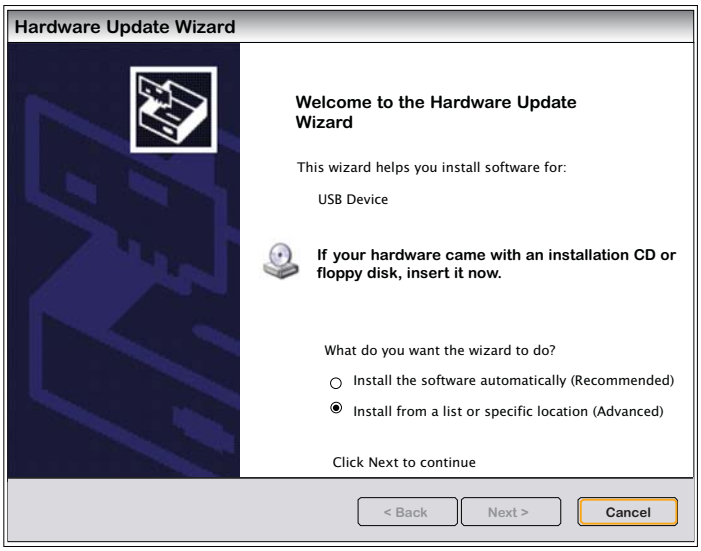


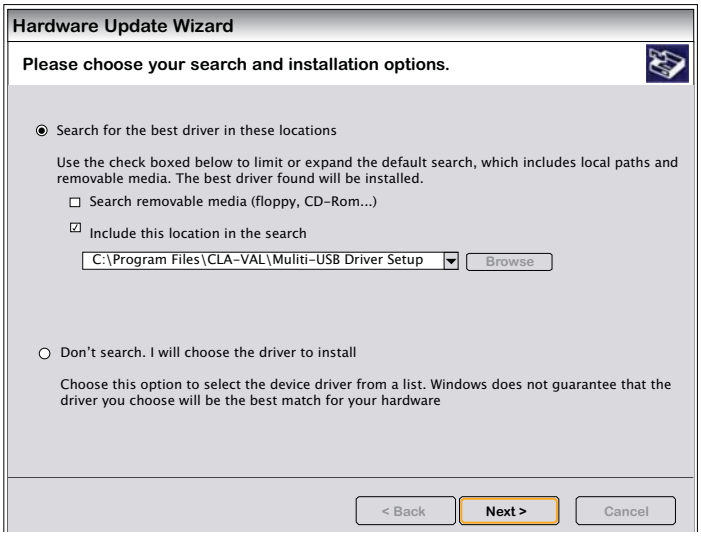


Installation is complete

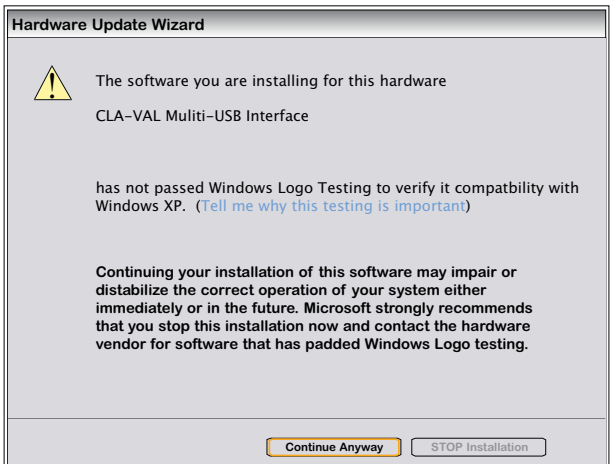
Update USB driver or install in another USB port

1. Download the Multi-USB Driver Setup software from our web site **www.cla-val.com**.
2. Connect USB cable to laptop.
3. Select: "Install from a list or specific location".
4. Browse to file: **C\Program Files\CLA-VAL\Multi-USB Driver**



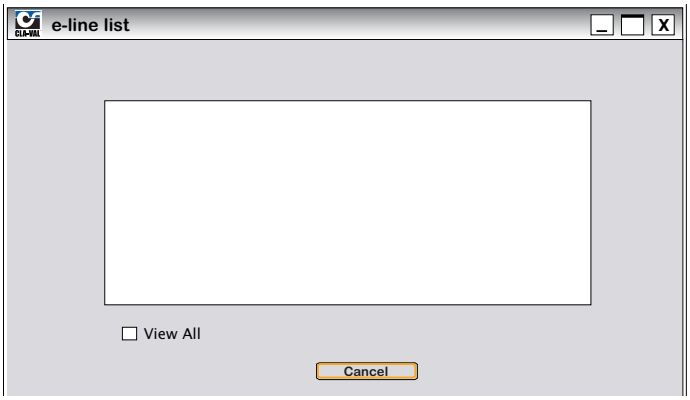


Microsoft Validation press "**Continue Anyway**".

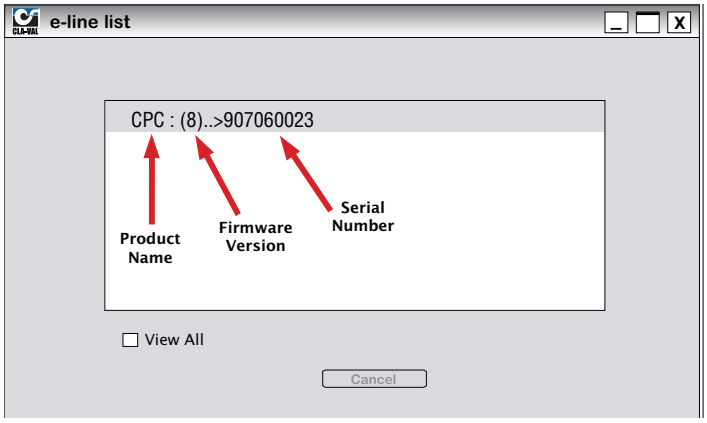


Configuration Mode

To open e-Drive Software when not connected to the actuator, the e-Line list will be empty. Click "Cancel" to launch. The software will open so that the various windows can be viewed to become familiar with the programming.



If you are connected to one or more CPC's or another e-Line product, click on "View All" then select the CPC you would like to communicate with from the list (see picture below) then click once on left mouse button.
The name of product, Firmware version and serial number are displayed.

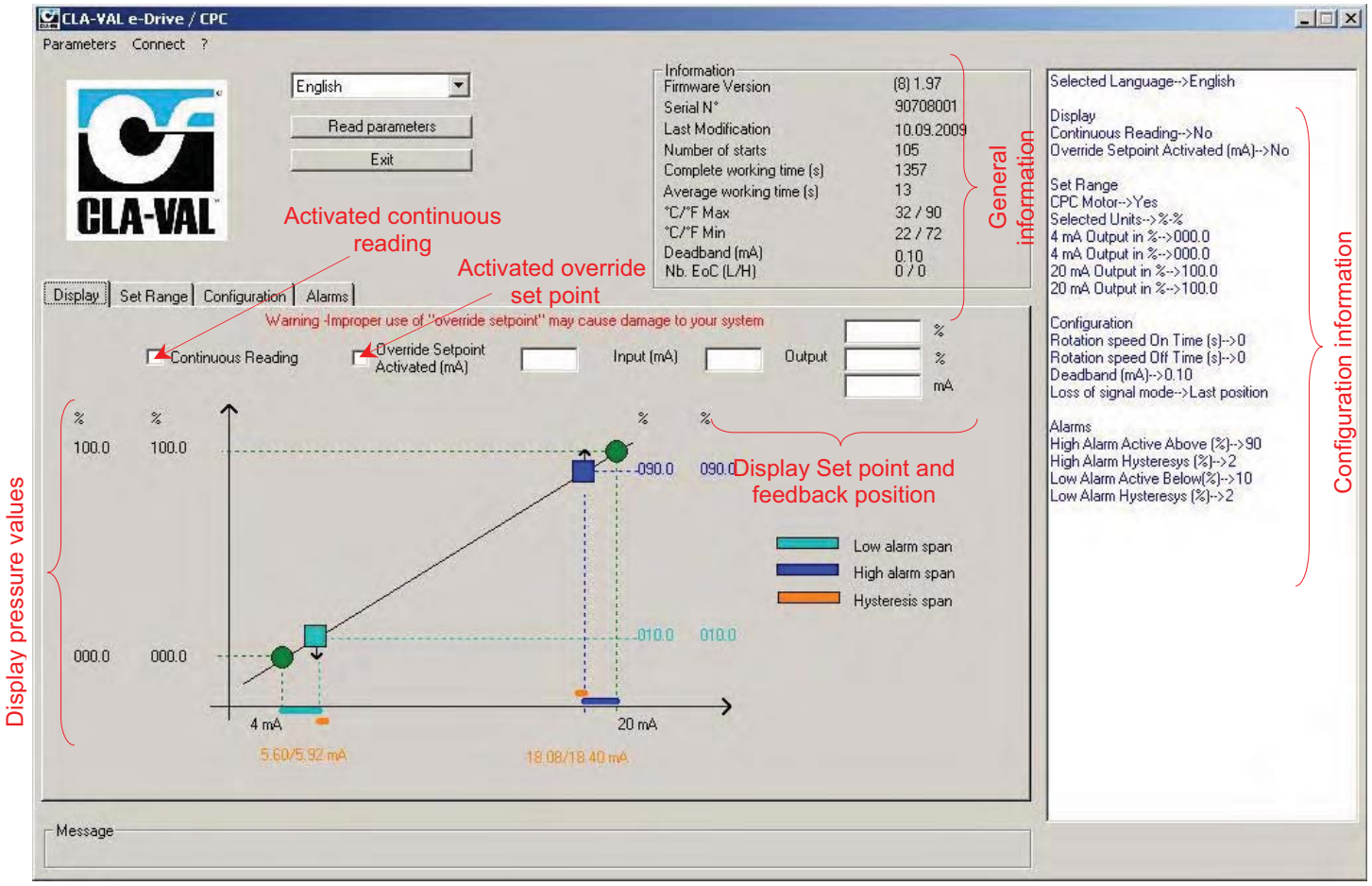


Programming Windows

Display Window

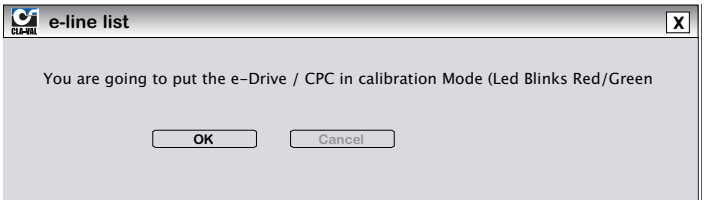
1. Connect CPC to the laptop using the USB cable.
2. Start the e-Drive/CPC CLA-VAL Software.
3. Select the CPC in the e-Line list.
4. Select language and click "**Read parameters**".
5. On the right side the configuration information is displayed.
6. On the top general information including the date of the latest calibration, the average & total working time since the first power up, the number of starts, the serial number, the Firmware version and the maximum and minimum recorded temperature are displayed.
7. Click on continuous reading if you would like see the position of CPC, set point (mA) and feedback position (mA and units).
8. If you would like to manually change the setting, write your setting and click on "**Override Setpoint**".

⚠ Improper use of "**Override Set Point**" may cause damage to your system.



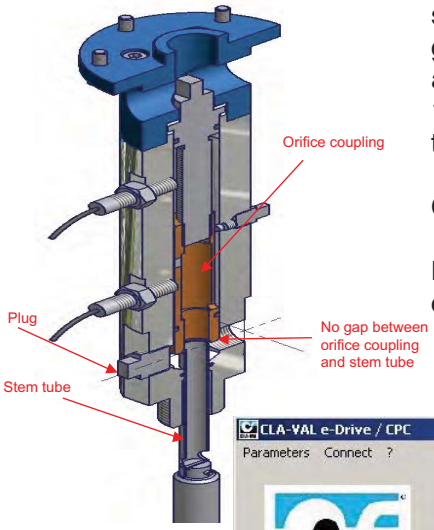
Static Calibration (0% - 100%)

The “Set range” allows calibration in either dynamic or static mode. When the “Set Range” is clicked, the following message appears. If you would like to proceed with calibration, click "OK", if not click "**Cancel**".



Initial preparation:

It is highly recommended that the valve and actuator assembly is isolated by closing upstream and downstream isolation valves and pressure is removed from valve. If this is not possible, consult the factory. The objective is to remove the site plug and visually determine the position of the “orifice coupling” with respect to the “stem tube”. They should be flush with no gap between the two assemblies (see Fig. 1). The procedure for this is shown below:



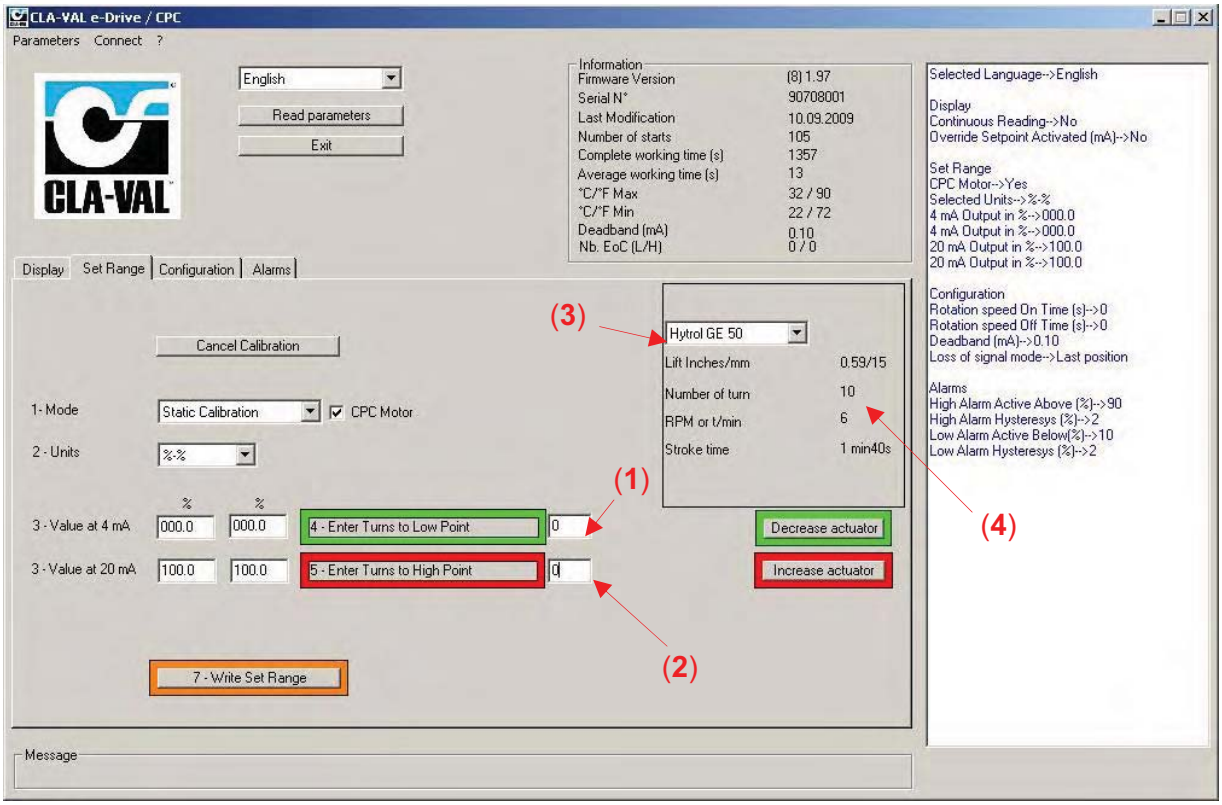
Orifice coupling

No gap between orifice coupling and stem tube

0-100% Calibration without System Pressure

1. Isolate and remove pressure from the valve assembly.
2. Remove plug as shown in figure 1.
3. Open e-Drive / CPC Software then go to "Set Range" tab and click OK on the menu.
4. Select "Static Calibration" Mode and check "CPC Motor" box is checked and select trim size from the drop down menu (3).
5. Using the "Increase actuator"/ "Decrease actuator" Buttons, adjust the position of the “orifice coupling” until there is no gap (flush) with the stem tube (See Fig. 1)
6. Select the valve size to be calibrated from the drop down menu (3) to determine the number of turns required to achieve full opening of the valve.
7. Select units.
8. Enter 4 mA value and 20 mA value.
9. Turns to low point (1): Enter the number ‘1’.
10. Turns to high point (2): Enter the “**Number of turns**” value for the valve selected (4) minus ‘1’.
11. Select "**Write Set Range**" to upload settings to CPC.

Calibration is complete



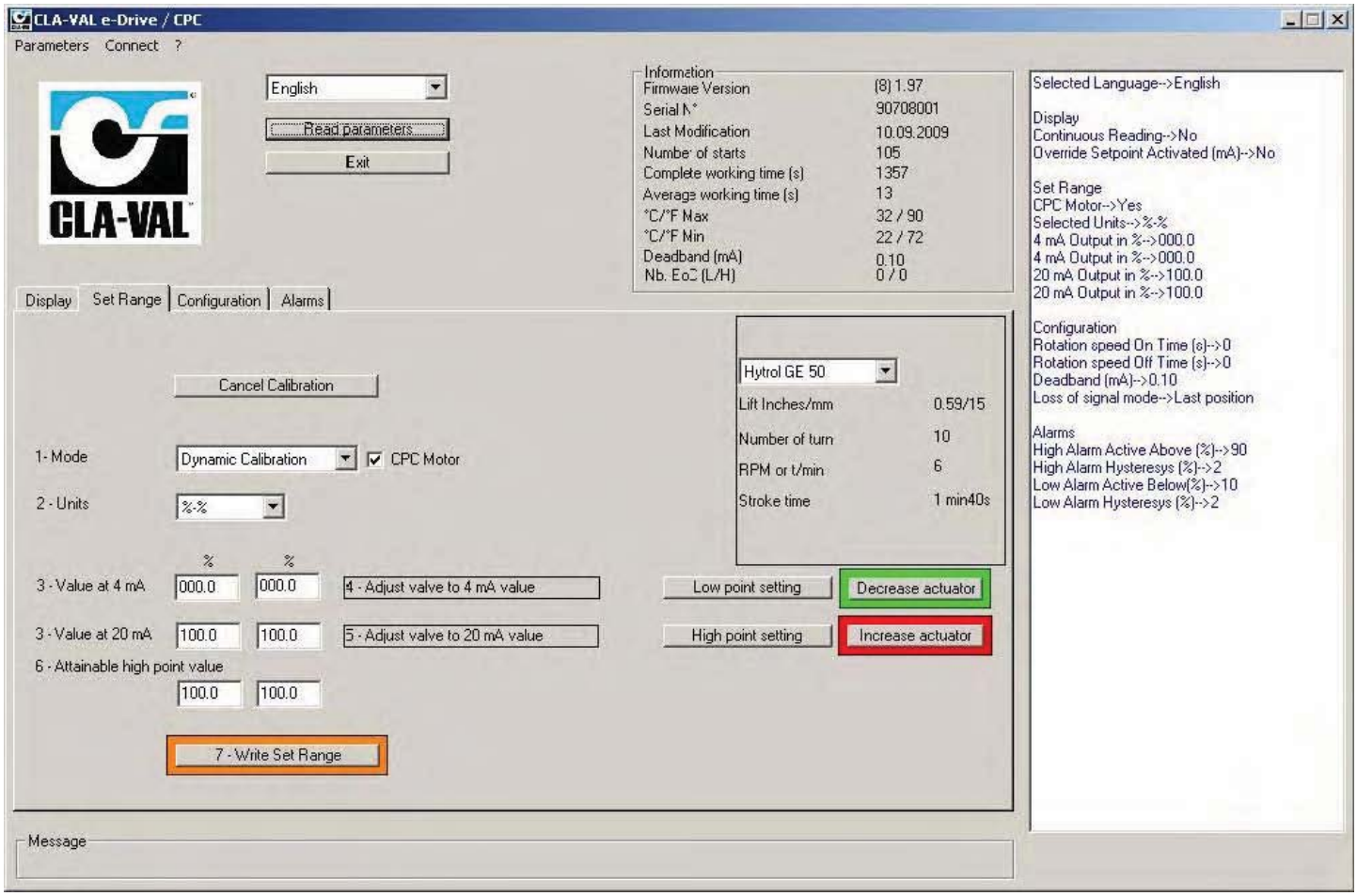
Calibration - Variable Range

Calibration Mode to a specific process WITH System pressure.

Initial preparation:

This calibration mode is for field installations where water pressure is available and you want to control flow over a specific range of positions.

Now you are in the calibration, please enter the required settings.



1. Select "**Dynamic Calibration**" mode and ensure that the "**CPC Motor**" check box is checked (Enabled).

2. Select units.

3. Enter the required setting Value at 4 mA point and Value at 20 mA point. Look at the position on the display and use the "**Increase actuator / Decrease actuator**" button, until it reaches.

4. The low position point. When the low position point is reached click on the button "**Low point setting**".

5. Look at the position on the display and use the "**Increase actuator / Decrease actuator**" button, until it reaches the high position.When the high position point is reached click on the button "**High point setting**".

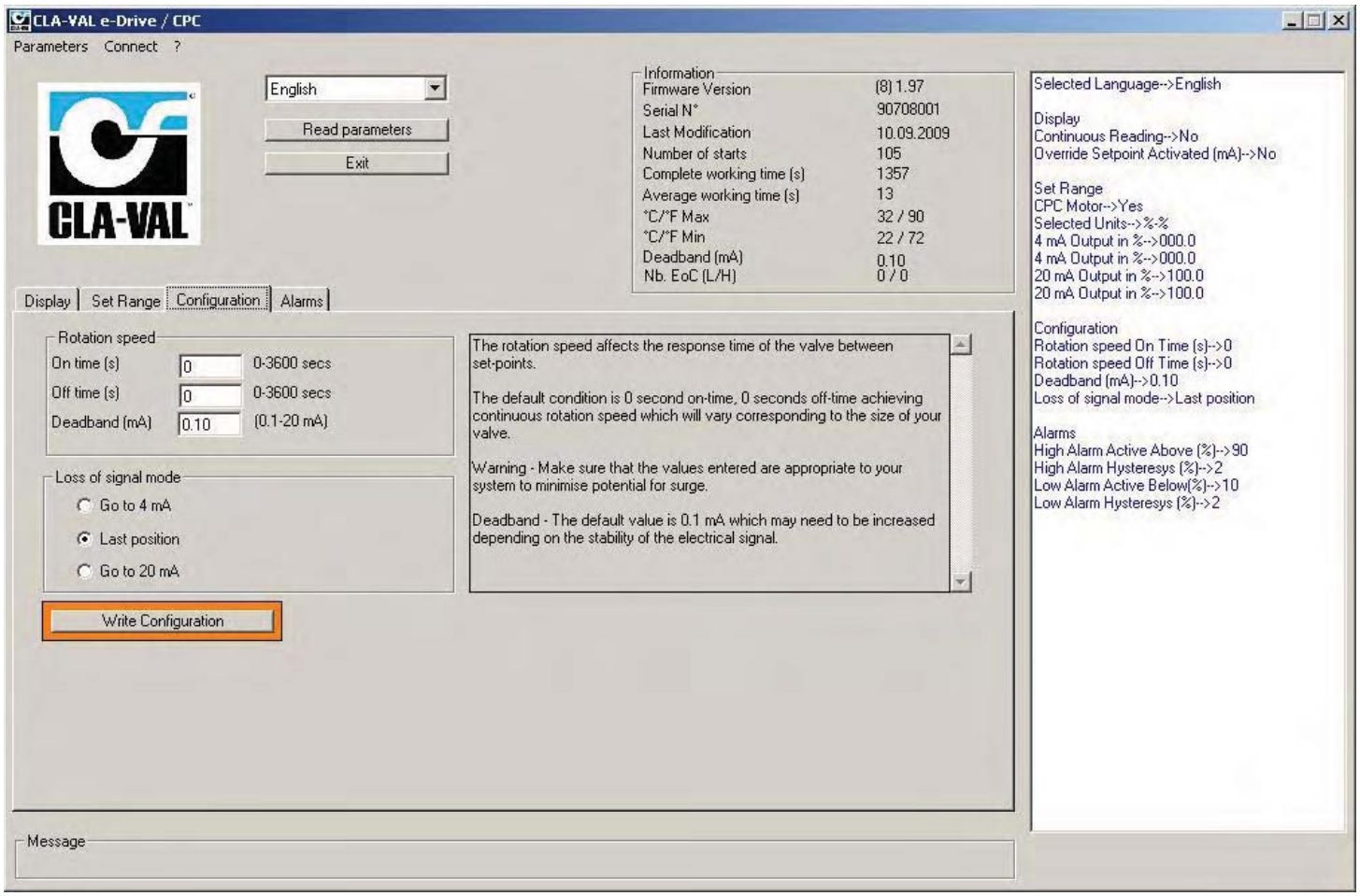
6. When all values have been entered, click on "**Write Set Range**". Your calibration is done.

Configuration

1. The configuration tab sets the Rotation speed and the Dead band.
2. The Rotation speed affects the response time of the valve between set-points.
3. The default condition is 0 seconds "**On-time**" and 0 seconds "**Off-time**" achieving continuous rotation speed which will vary corresponding to the size of your valve.
4. Make sure that the values entered are appropriate to your system to minimize potential for surge.
5. Dead band - The default value is 0.1 mA which may need to be increased depending on the stability of the electrical signal.
6. Choose the loss of signal mode.
7. Go to 4 mA: CPC will default to the 4 mA position (low set point).
8. Last position: CPC will maintain the last position.
9. Go to 20 mA: CPC will default to the 20 mA position (high set point).

Note: Loss of signal can occur on the SCADA system which generates the 4-20 mA command but at the same time the CPC can stay powered, so it is important to select the right option. When you have finished your configuration, click on "**Write Configuration**".

Your CPC is configured.



Alarms

The CPC incorporates a LOW and HIGH Alarm with an adjustable hysteresis setting. The low and High alarm levels are activated within the range:

Example: 10% low alarm = 4 + (10% x 16) = 5.6 mA. 90% High alarm = 4 + (90% x 16) = 18.4 mA.

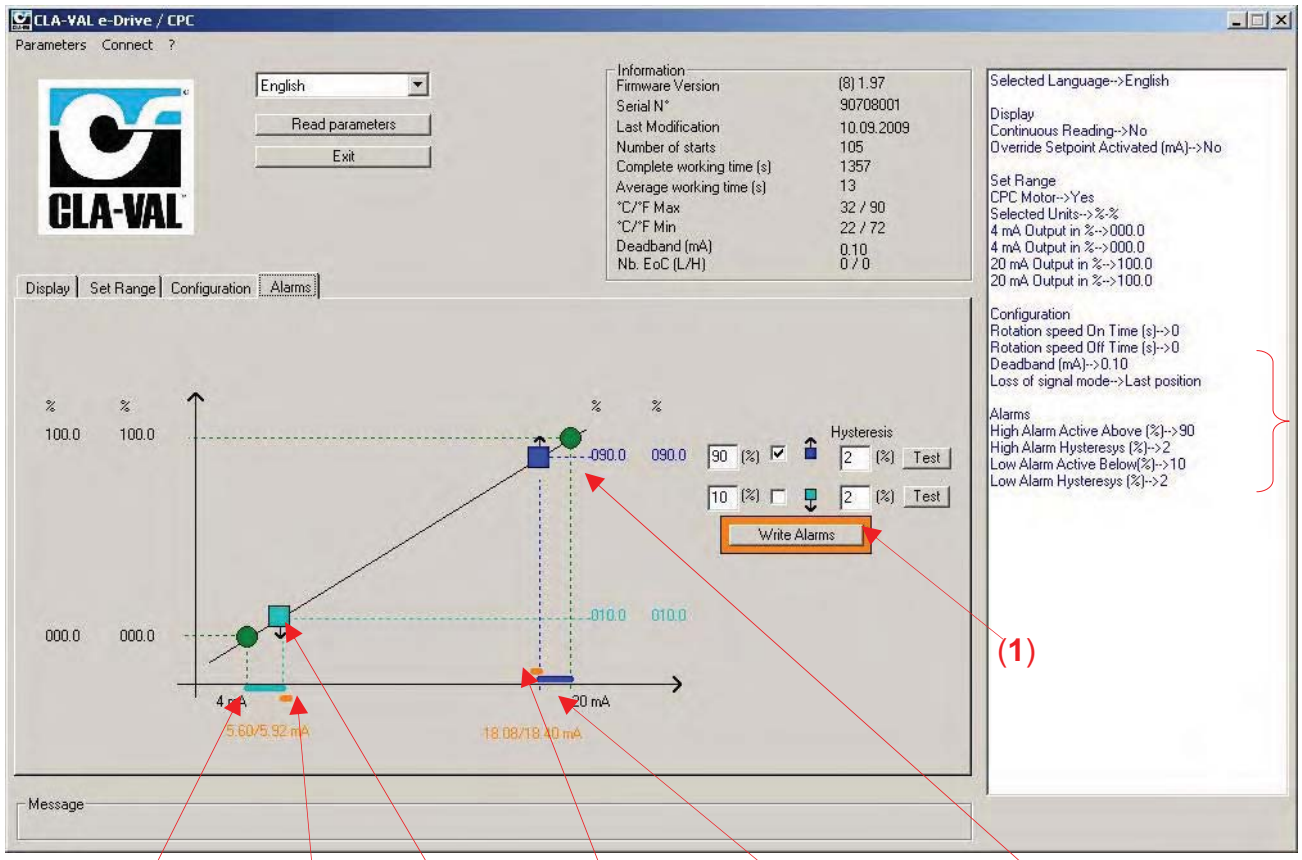
Hysteresis:

1. The calculation is: 4 + (2% x 16) = 0.32 mA.
   Low alarm hysteresis in this example = 5.6 mA + 0.32 mA = 5.92 mA.
   High alarm hysteresis in this example = 18.4 mA - 0.32 mA = 18.08 mA.

2. Enter the requested percentage, for the alarms and hysteresis.

3. Click on "**Test**" to close or open your contact relay.

4. Click on "**Write Alarms**" (1) once your alarm settings are correct.



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