



CLA-VAL D12

Electronic Valve Controller

User Manual



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1 INTRODUCTION

1.1 PRECAUTIONS BEFORE STARTING



: Before usage, make sure that the latest software version is installed on your device. You can download the latest software from: www.cla-val.ch.



: This equipment must be handled with precaution. CLA-VAL electronic products are robust and designed to work under field environmental conditions, but high shocks and strong mechanical constraints can damage the equipment and/or alter its functionality.

1.2 TROUBLESHOOTING

1.2.1 NOTHING ON THE OLED DISPLAY

A) Check if there is a proper battery connection in the Electronic Valve Controller. A low voltage (below 3.3V) could imply having no information on the OLED display.

B) Check that the device is not in standby mode by holding the magnetic stick over the  button for 5 seconds.

1.2.2 AN INPUT OR VARIABLE IS DISPLAYED IN RED, ORANGE OR BLUE

See the colour coding convention used on the Electronic Valve Controller for the inputs, outputs and variables in chapter 3.1.

1.2.3 ISSUE WITH THE BEHAVIOUR OF THE VALVAPPS™

Refer to the technical datasheet related to your *ValvApps™*, and especially the block diagram and the logic scheme explaining its behaviour.

For any remaining issue, please contact CLA-VAL.

1.3 GENERAL DISCLAIMER

In accordance with our policy of continuous development and improvement, CLA-VAL reserves the right to modify or improve its 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.

1.4 ENVIRONMENTAL PROTECTION

Help to preserve and protect the environment. Recycle used equipment and accessories.

1.5 TYPOGRAPHY

Throughout this manual, the following typographical conventions and symbols have been adopted to help readability:

- "**Bold**": Menu, command, tab and button.
- BOLD ITALIC***: Important information.
- (1)**: Number of the reference marks on image.
- www.cla-val.ch: Internet address.



e. : Some tips.



f. : Warning!

2 ELECTRICAL & MECHANICAL DETAILS

2.1 TECHNICAL CHARACTERISTICS

Enclosure	
Material	Flame retardant PC/ABS plastic
Connections	8 (eight) SOURIAU™ UTS circular sockets to connect external sensors 1 (one) USB A connector (for external USB key)
Dimensions	174 mm H x 115 mm W x 85 mm D
Protection	IP68 (1 month under 2 meters)
Mounting Bracket	Stainless steel
Power Requirements	
Voltage Input	6 VDC to 24 VDC (compatible with CLA-VAL e-Power MP / 2 MP turbines)
Power Consumption	10 mA in stand-by, 30 mA nominal when regulating (up to 2000 mA peak consumptions)
Protection	32 VDC over-voltage protection Reverse voltage protection
Inputs (SOURIAU Circular sockets)	
Analog (AI1 to AI4)	2 (two) 0-5V (pressure sensor) & 2 (two) 4-20 mA inputs (max. voltage = 32 VDC)
Digital (DI1 to DI4)	4 (four) dry contacts inputs (max. voltage = 5 VDC @ 0.1 A, max. frequency = 100 Hz)
Units	Configurable
Decimal point	1 ("0") to 4 ("0.000") significant digits
Signal filter	Cumulative filter configurable 1% to 99%, or disabled
Totalizer	Configurable input and units
Outputs (SOURIAU Circular sockets)	
Solenoid (SO1 to SO4)	4 (four) latching or digital output (6 VDC @ 0.5 A - binary or proportional)
PID Control Parameters	
Proportional Band	0% to 100% (adjustable in 1% increments - independently for opening and closing)
Dead Band	Adjustable from 0 to full-scale of set-point signal
Cycle Time	10 s to 60 s (adjustable in increments of 1 s)
Integral Band	0 s to 60 s (adjustable in increments of 1 s)
Derivative Band	0 s to 60 s (adjustable in increments of 1 s)
Loop Zoning	Up to 4 zones
PID Loops	Up to 4
Display & Navigation	
Display	1.5" OLED display (128 x 64)
Navigation	5 (five) ILS (magnetic) contacts and magnetic stick for navigation
Communication	
Interfaces	GPRS, Wifi, USB
Protocols	VNC, FTP, HTTPS
Logging	
Process	Manual and Automatic
Memory	Internal memory, SD card (4 GB default), Export to USB, Export to FTP server
Logging speed	1 minute
Format	CSV file (proprietary format)
Temperature Range	
Working Temperature	-10°C to +60°C
Storage Temperature	-30°C to +60°C

3 NAVIGATION

3.1 COLOUR CONVENTION

Values are usually displayed in black; however input values can sometimes be displayed in different colour's, depending on the status of the associated input:

- Black: normal status. The value displayed is what is measured on the input
- Red: loss of signal. The associated input has no signal arriving
- Orange: loss of signal, and the system overrides the value
- Blue: local override. The value has been manually overridden locally and the signal at the input is not taken into account
- Grey: remote signal

3.2 BASIC VNC SOFTWARE INTERFACE BUTTON FUNCTIONALITY

3.2.1 BUTTON DESCRIPTION

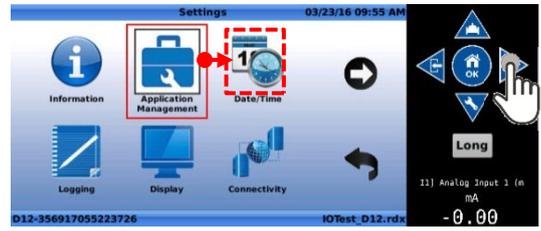
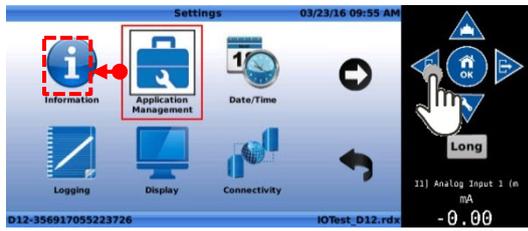
-  - Home/OK
-  - Left/Input
-  - Right/Output
-  - Up/Valve Configuration
-  - Down/Settings

Other Icons in this manual

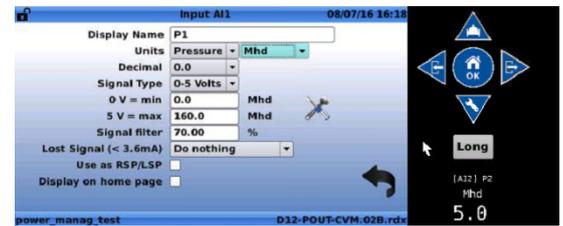
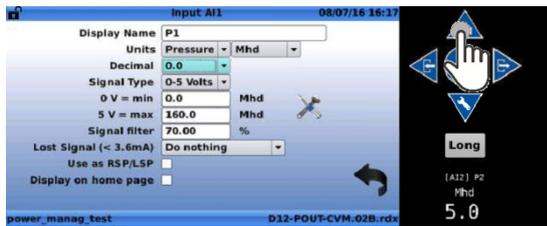
-  - Short Click
-  - Long Click (click on button "Long")

3.2.2 SHORT CLICK

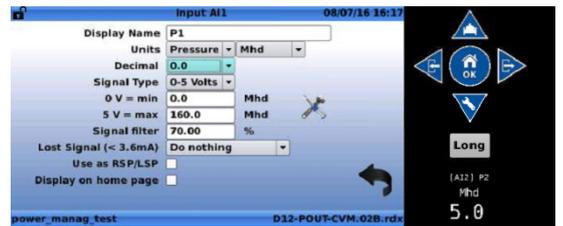
-  Is "Ok" or "Select" when used as a  (short click)
-  - When used as a , the cursor moves to the left
-  - When used as a , the cursor moves to the right



- When used as a , the cursor moves up

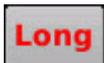


- When used as a , the cursor moves down



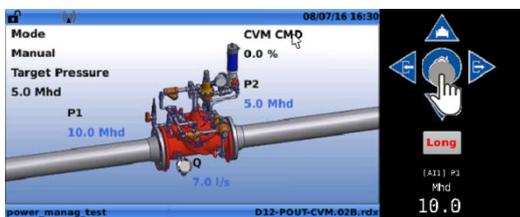
3.2.3 "LONG" BUTTON - OK CLICK ("HOME/OK" BUTTON ONLY)

To activate the long click, click on the "Long" button, which will then be displayed in red. Clicking a second time on

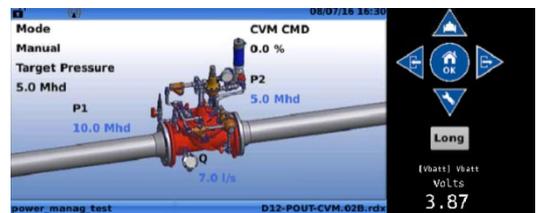
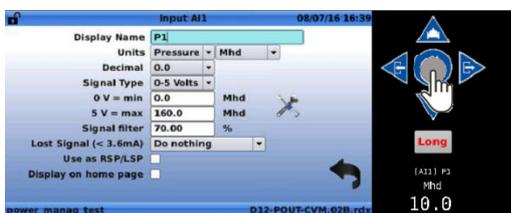


will deactivate the long click and the text will be displayed in black.

From the home screen, a "Long" button activation and click on "Home/OK" will put the Electronic Valve Controller into sleep mode.



From any other location, a "Long" button activation and click on the "Home/OK" button returns to the "Home Screen".

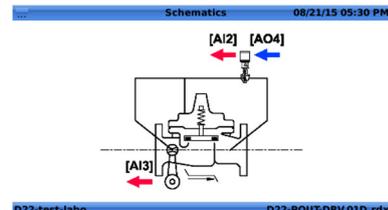
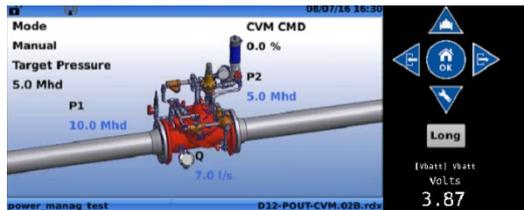


3.3 BUTTON DESTINATIONS

3.3.1 "UP/VALVE CONFIGURATION"

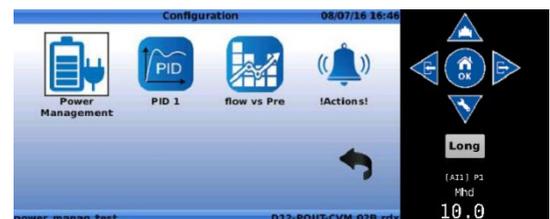
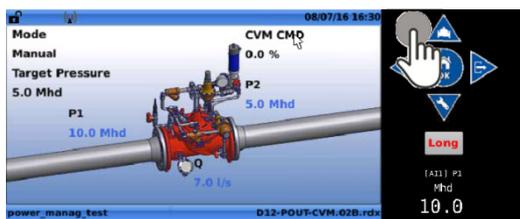
A) "Short Click": View Valve Information (from Home Screen).

From the "Home Screen", a on the button navigates to the "Valve Information" screen.



B) "Long button": Enter Valve Configuration Menu (from Home Screen).

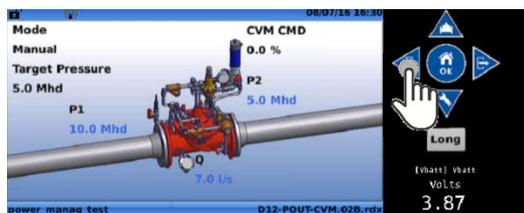
From the "Home Screen", a button activation and click on the navigates to the "Valve Configuration" screen.



3.3.2 "LEFT/INPUT"

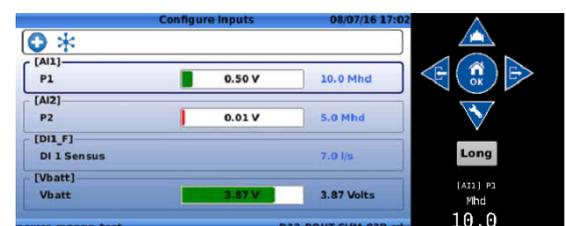
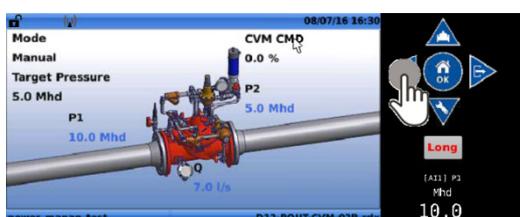
A) "Short Click": View Input Information (from Home Screen).

From the "Home Screen", a on the navigates to the "Inputs" screen.



B) "Long button" activated - Enter Input Configuration Menu (from Home Screen).

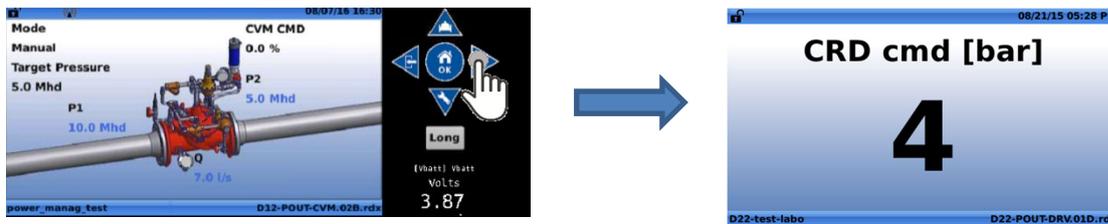
From the "Home Screen", a button activation and click on the navigates to the "Configure Inputs" screen.



3.3.3 "RIGHT/OUTPUT"

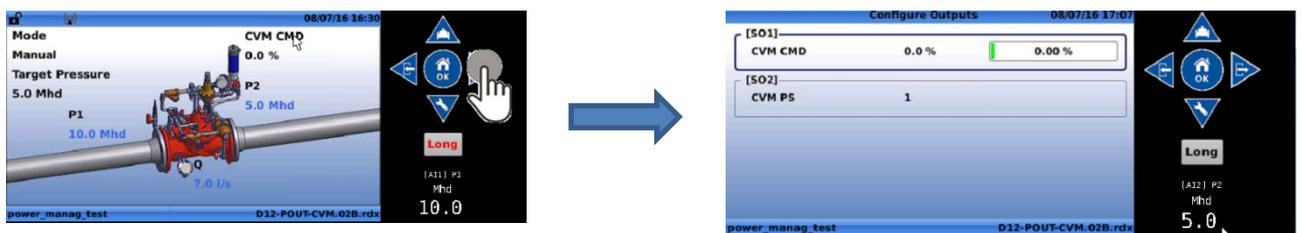
A) "Short Click": View Output Information (from Home Screen).

From the "Home Screen", a on the navigates to the "Outputs" screen.



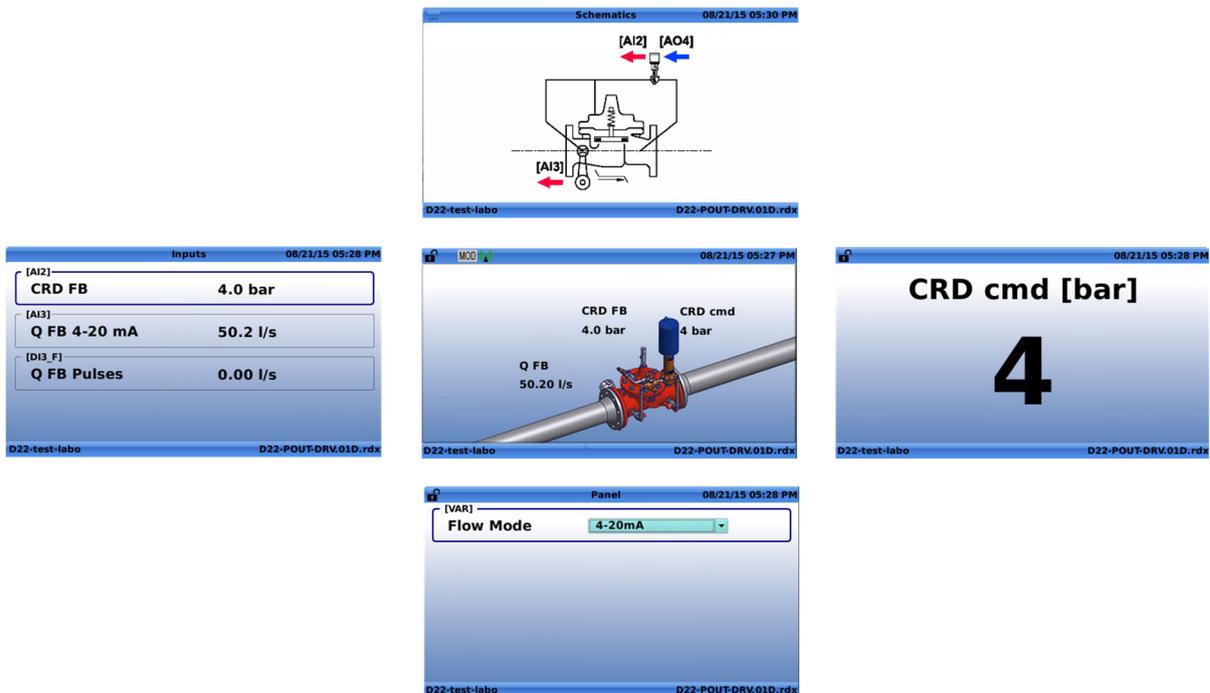
B) "Long Button" activated: Enter Output Configuration Menu (from Home Screen).

From the "Home Screen", a activation and click on the navigates to the "Configure Outputs" screen.



Menu Locations

3.3.4 INFORMATION SCREENS



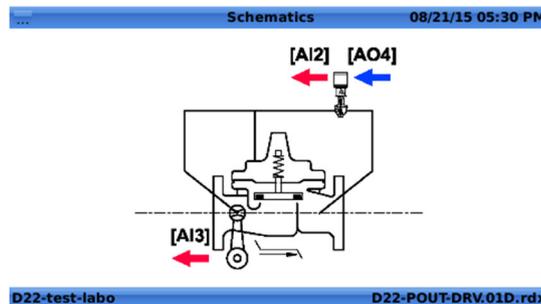
A) **"Inputs"**: The Inputs menu displays all of the activated inputs in current use by the selected **ValveApps™**.



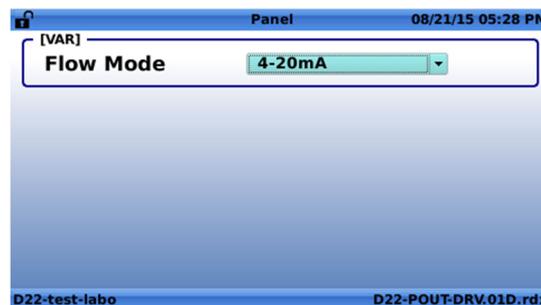
B) **"Outputs"**: The outputs menu displays all of the activated outputs in current use by the selected **ValveApps™**.



C) **"Schematics"**: The Schematics menu displays the simplified valve schematics for a given **ValveApps™** and the connected inputs and outputs.

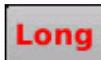


A) **"Display Panel"**: The Display Panel displays all of the activated variables in current use by the selected **ValveApps™**.



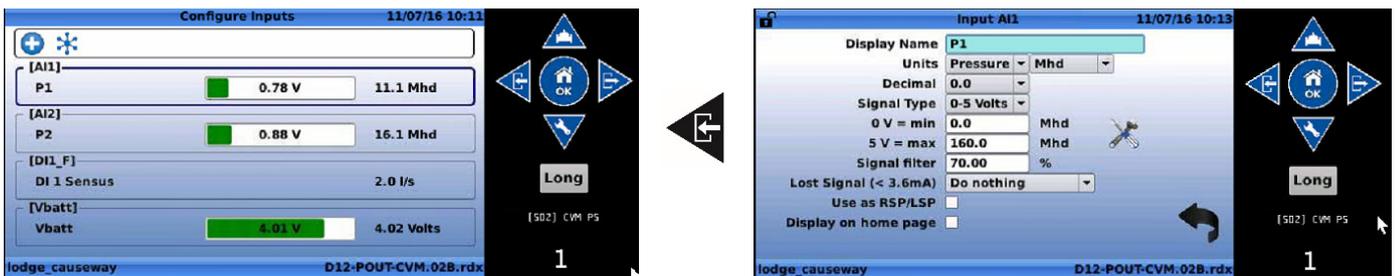
3.3.5 CONFIGURATION MENUS



The "Configuration" screens are accessed with a "long button"  from the "Home Screen".

3.3.5.1 "Configure Inputs" Menu

A "short click" on "Left/Input"  from the "Configure Inputs" screen enters the configuration of the selected input.



Input Field Descriptions:

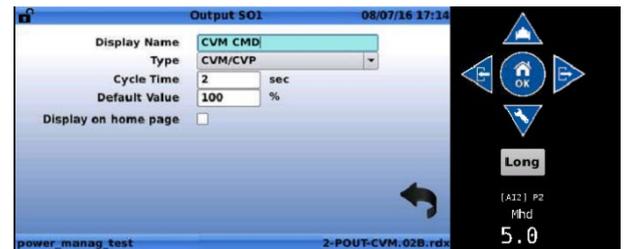
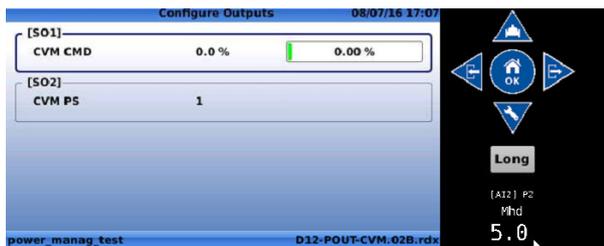
- "Display Name": Use this field to choose a unique name for each input.
- "Units": Choose from the following available units:
 - (gpm) - Gallon per minute [flow];
 - (mgd) - Mega Gallons per day [flow];
 - (cfm) - Cubic Feet per minute [flow];
 - (cfs) - Cubic feet per second [flow];
 - (l/min) - Litres per minute [flow];
 - (l/s) - Litres per second [flow];
 - (m3/h) - Cubic meters per hour [flow];
 - (Ml/d) - Mega litres per day [flow];
 - (Imp gpm) - Imperial Gallons per minute [flow];
 - (bar) - Bar [pressure];

- (kPa) - Kilopascals [pressure];
- (Mld) - Mega Litres per day [flow];
- (psi) - Pounds per square inch [pressure];
- (m) - Meters of water [pressure];
- (in) - Inches of water [pressure];
- (ft) - Feet of water [pressure];
- (%) - Percentage [unit-less];
- (h) - Hours [time];
- (min) - Minutes [time];
- (s) - Seconds [time];
- (gal) - Gallons [volume];
- (mg) - Mega gallons [volume];
- (cf) - Cubic feet [volume];
- (l) - Litres [volume];
- (m³) - Cubic meters [volume];
- (Ml) - Mega liters [volume];
- (mA) - Milliamps [electrical flow];
- (Volt) - Volts [electrical potential];
- **"Decimal"**: Select from available decimal places:
 - 0
 - 0.0
 - 0.00
- **"Signal Type"**: Select from available signal types:
 - 4-20 mA
 - 0-5 V (pressure sensor)
- **"4mA ="**: Set the value of the input at 4 mA; usually this will correspond to a value of 0.
- **"20mA ="**: Set the value of the input at 20 mA; this should correspond to the maximum measured value.
- **"0V ="**: Set the value of the input at 0 V; usually this will correspond to a value of 0.
- **"5V ="**: Set the value of the input at 5 V; this should correspond to the maximum measured value.
- **"Signal Filter"**: Select a filter length between 1% and 99%. This is a cumulative filter, where the value corresponds to the weight of the previous sample. The higher the value, the higher the filtering effect. A 0% value will inactivate the filter.
- **"Lost Signal (< 3.6 mA)"**: This menu designates which action the controller will take in the event that a signal falls below 3.6 mA, usually when there is a power outage or when the 4-20 mA loop has been broken.
 - **"Default Value"**: This option allows the user to input a value to be inserted when the 4-20mA input signal has been lost.
 - **"Keep Value"**: This option allows the user to specify that the last input value received by the controller will be the value that is used once the signal is lost.
 - **"Do nothing"**: This option will specify that no action is taken by the controller when an input signal is lost.
- **"Use as RSP/LSP"**: When this box is checked, the input is treated as an RSP/LSP - Remote Set Point / Local Set Point. This allows the input to be seen in the Display Panel (short click down -  + ) and allows Actions to be taken when the Remote Set Point is changed or overridden.
- **"Display on home page"**: When this box is checked, the input is shown on Display panel.
- **"Menu tools **": Click on this button to calibrate the pressure sensor.

 To calibrate the pressure sensor properly, it must be disconnected from the valve in order to read atmosphere pressure.

3.3.5.2 "Configure Outputs" Menu

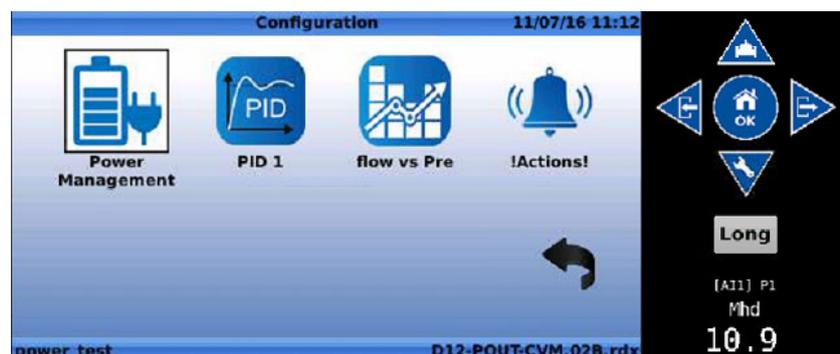
A "short click" on "Right/output"  from the "Configure Outputs" screen enters the configuration of the selected output.



Solenoid Output (SO) Field Descriptions:

- "Display Name": Use this field to choose a unique name for each output.
- "Type":
 - "CVM/CVP": its PWM output (Pulse Width Modulation): this is the industry trade name for the management of pulses sent to the opening/closing CVM/CVP pilots.
 - "Latching Output 1/0": Provide a pulse for 200 ms by default open (1) or close (0) the bistable solenoid.
 - "Digital 1/0": Specifies that the output is either open or closed for the time specified in the boxes below. Its use to provide power supply on CVM/CVP pilots (6VDC).
- "Cycle Time": The amount of time for one complete cycle of action for the opening/closing CVM/CVP pilots.
- "Default Value": The default active time of the CVM/CVP pilots during the cycle.
- "Display on home page": When this box is checked, the input is shown on Display panel.

3.3.5.3 "Valve Configuration" Menu



The "Valve Configuration" screen includes the regulation blocks related to the loaded **ValvApps™**. Regulation blocks can be of the following types:



PID



Control Curve



!Action!



Power Management

- **PID (Proportional-Integral-Derivative):**

The "PID" regulation maintains the valve at a configured set-point. Up to four (4) "PID" regulation loops can be programmed, each of them offering local or remote set-point capability. Real-time chart view helps to visualize valve response and fine tune the Electronic Valve Controller accordingly. Perfect valve control is achieved by CLA-VAL features such as programmable set-point ramping to prevent hydraulic shocks.

- **Control Curve:**

The "Control Curve" offers an easy way to create a relationship between 2 system variables. Using graphical functions the user draws the "Control Curve" relationship linking pressure, flow, level and/or time directly on the Electronic Valve Controller screen. Up to four (4) "Control Curves" can be profiled allowing specific adaptation such as seasonal adjustment.

- **!ACTION!:**

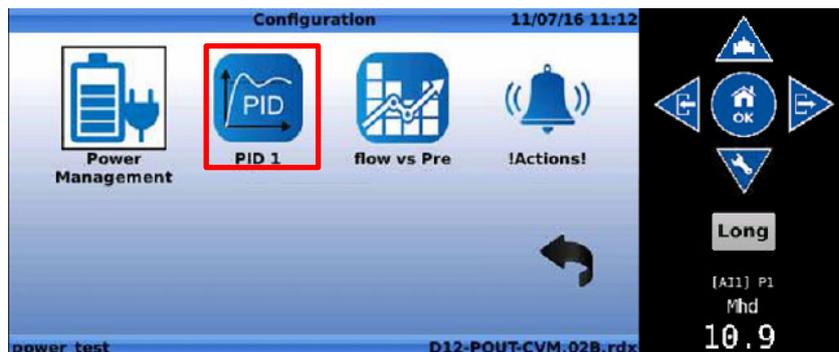
Used to take action (or alarms) when a programmable condition is met by forcing an output (relay, solenoid, 4-20 mA). The closing relay can be used to send an alarm to a supervision system. Up to four (4) "!"Actions!" can be programmed including appropriate hysteresis or dead band configuration.

- **Power Management:**

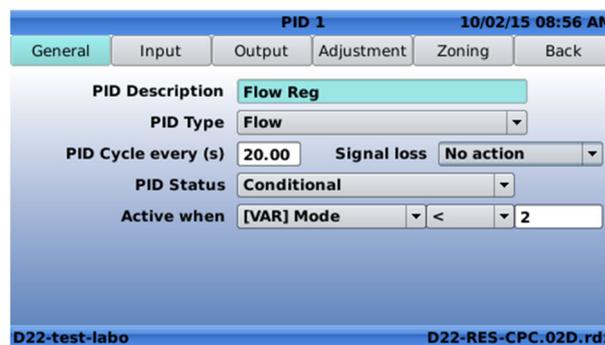
This is used to manage the unit Power and prevent excessive battery discharge. It can be used on flow or differential pressure.

The power management allows activating default values, according to user pre-programmed rules.

3.3.5.4 Valve configuration - "PID Menu"



A) General Tab



Input Field Description:

- "PID Description": Use this field to choose a unique name for each PID loop
- "PID Type": Designate what type of control is being used
 - "Flow": Control using flow SetPoint and Feedback
 - "Pressure": Control using pressure SetPoint and Feedback

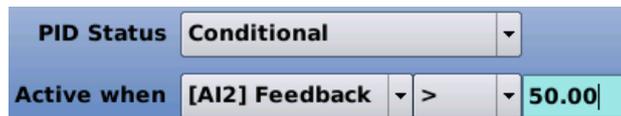
- "Level": Control using level SetPoint and Feedback
- "%": Control using percentage open (position of the valve) SetPoint and Feedback
- "Analog": Control using flow SetPoint and Feedback
- "PID Cycle every (s)": This field designates how often the calculation will be performed to determine the appropriate action to be taken with the output, minimum value is 10 seconds
- "Signal loss": This field designates what action the controller will take when there is a loss of signal on the Remote Set Point (RSP). The options are:
 - "No Action"
 - "Open 100%": Open valve 100%
 - "Close 100%": Close valve 100%
 - "Lock Position": Maintain valve in current position
- "PID Status": The user may configure a PID loop, but not activate it until the appropriate time. The choices are:
 - "On"
 - "Off"
 - "Conditional": When the "Conditional" option is chosen, an additional field appears and prompts the user to specify when the PID should be active. The following field is shown:



PID Status: Conditional
Active when: Always

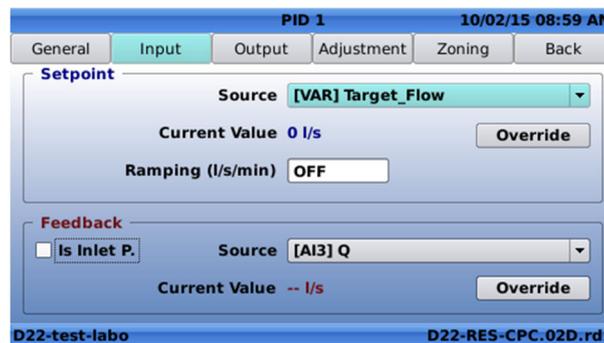
The PID loop can be configured to be always active, or when one of the inputs meets a certain condition. In this case, use the pull down menu that is defaulted to "Always" to select the appropriate input, then use the pull down menu to the right to select an operator, such as the "Greater than" sign (>), then specify a value.

Example: The following PID loop has been set to be conditional active, only when the Feedback [AI2] is greater than 50.00 l/s.



PID Status: Conditional
Active when: [AI2] Feedback > 50.00

B) Input Tab



PID 1 10/02/15 08:59 AM

General Input Output Adjustment Zoning Back

Setpoint

Source: [VAR] Target_Flow

Current Value: 0 l/s [Override]

Ramping (l/s/min): OFF

Feedback

Is Inlet P. Source: [AI3] Q

Current Value: -- l/s [Override]

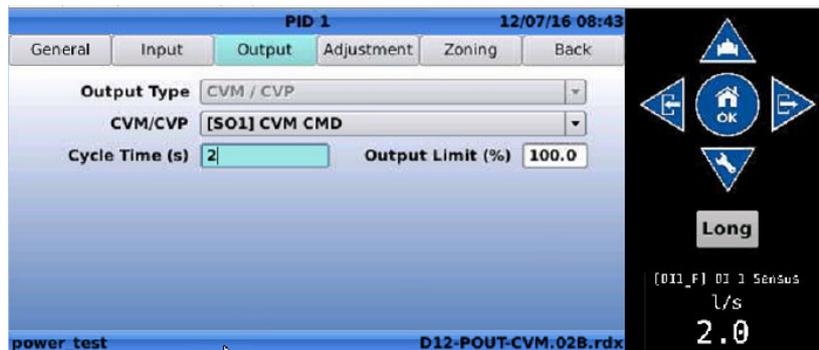
D22-test-labo D22-RES-CPC.02D.rdx

Input Field Description:

- **Setpoint Section:**
 - "Source": Designates which compatible input or variable is to be used as the SetPoint for the PID loop
 - "Current Value": Shows the *live* current value of that input
 - "Override": Allows the user to input an override value from this menu rather than having to go back to the input information or input configuration screens - this can be helpful when commissioning a system for the first time

- **"Ramping (l/s/min)":** Increases or decreases the set point over period x when a new set point is entered to help prevent overshoot or undershoot of the target value. [either by **"Remote Set Point"** Changes or **"Local Set Point"** (override) changes]
- **Feedback Section:**
 - **"Source":** Designates which input is to be used as the feedback for the PID loop
 - **"Current Value":** Shows the *live* current value of that input
 - **"Override":** Allows the user to input an override value from this menu rather than having to go back to the input information or input configuration screens - this can be helpful when commissioning a system for the first time

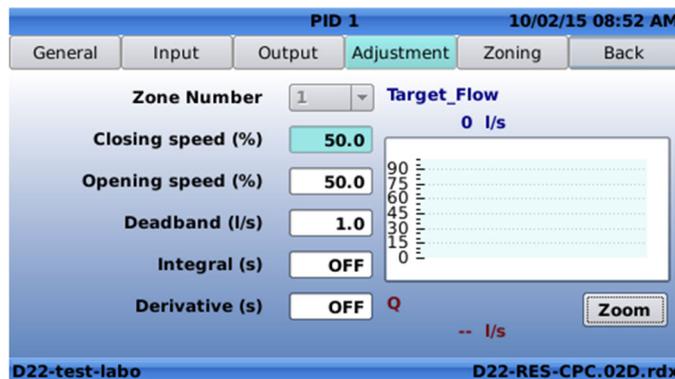
C) Output Tab



Input Field Description:

- **"Output Type":** Designates what type of output is used.
 - **"CVM/CVP":** Uses solenoid output (1 or 2) to control the pilot, according to the PID regulation
- **"Cycle Time (s)":** Designates the total cycle of action for the "CVM/CVP" command
 - **"Output limit (%)":** Designates valve opening/closing limit

D) Adjustment Tab



Input Field Description:

- **"Zone Number":** Designates which PID loop is being adjusted; at any time, up to 4 PID loops may be used
- **"Closing Speed (%)":** Designates how quickly the valve will be able to close. 1% is the slowest possible, 99% is the fastest possible



NOTE: The actual time to close will depend on the hydraulic conditions.

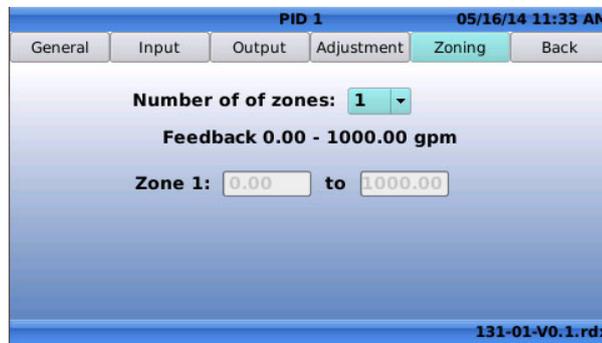
- **"Opening Speed (%)":** Designates how quickly the valve will be able to open. 1% is the slowest possible, 99% is the fastest possible



NOTE: Actual time to open will depend on the hydraulic conditions.

- **"Deadband (l/s)":** Designates where the controller will take no action because it is close to the SetPoint.
Example: If the setpoint is 50 l/s and the deadband is set at 2 l/s, then the controller will take no action on the feedback value from 48 l/s to 52 l/s
- **"Integral (s)":** This value is used for fine tuning of very sensitive systems
 It is not recommended that this be used without contacting CLA-VAL Technical Support!
- **"Derivative (s)":** This value is used for fine tuning of very sensitive systems
 It is not recommended that this be used without contacting CLA-VAL Technical Support!

E) Zoning Tab



PID 1 05/16/14 11:33 AM

General Input Output Adjustment Zoning Back

Number of zones: 1

Feedback 0.00 - 1000.00 gpm

Zone 1: 0.00 to 1000.00

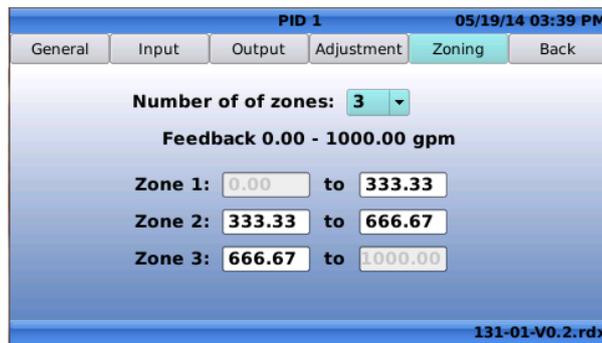
131-01-V0.1.rdx

Input Field Description:

- **"Number of zones":** Designates how many PID zones are to be created



NOTE: When multiple PID loops are created, the active region for each is designated by an equal division of the total feedback range, see example below:



PID 1 05/19/14 03:39 PM

General Input Output Adjustment Zoning Back

Number of zones: 3

Feedback 0.00 - 1000.00 gpm

Zone 1: 0.00 to 333.33

Zone 2: 333.33 to 666.67

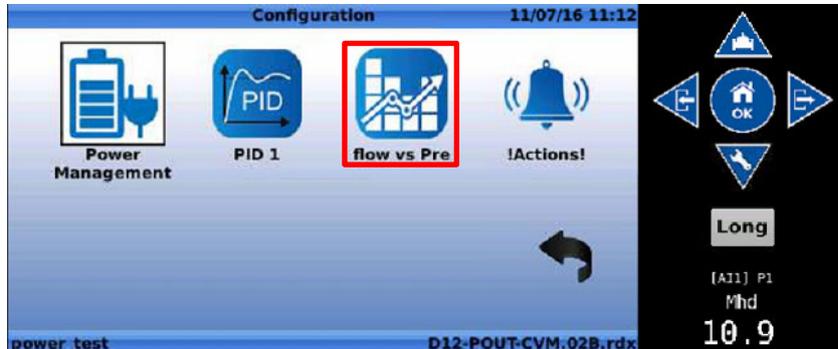
Zone 3: 666.67 to 1000.00

131-01-V0.2.rdx

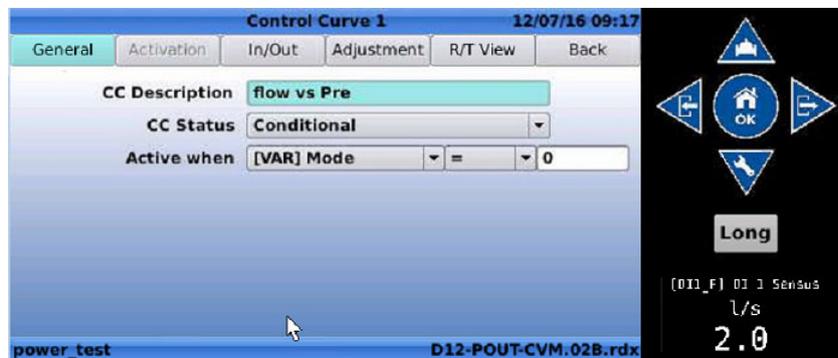
The active region for zones 1, 2 and 3 are each one third of the total feedback range. These values can be specified by changing the values in each zone, according to the needs of the user.

- Zone 1: designates the top of the range for zone 1 (bottom range is bounded by the low level of the feedback scale).
- Zone 2: designates the bottom and top range for zone 2.
- Zone 3: designates the bottom range for zone 3 (top of the range is bounded by the high level of the feedback scale).

3.3.5.5 Valve configuration - "Control Curve Menu"



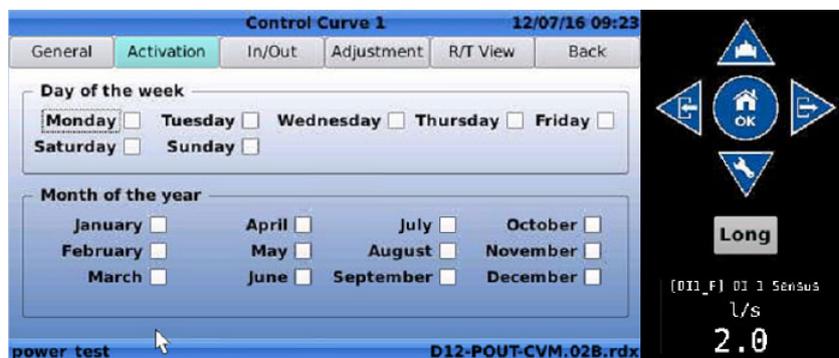
A) General Tab



Input Field Description:

- "CC Description": Designate a name for the custom control curve
- "CC Status": Designate whether the control curve is active
 - "On": The control curve is active
 - "Off": The control curve is inactive
 - "Calendar": The control curve is activated according to calendar rules, which are defined in the "Activation" tab
 - "Conditional": Condition based on an input or variable, as defined in the "Active when" field
- "Active when": Designate the rule for the conditional activation

B) Activation Tab (only for calendar activation)



Input Field Description:

- "Day of the week": Designates which day(s) of the week the custom control curve is active
- "Month of the year": Designates which months the selected days are active

C) In/Out Tab



Input Field Description:

"Input" Section:

- "Source": Designate the input flow signal location

"Output" Section:

- "Destination": Designate the analog output location for the motorized control
- "Override": Override the output in "Designation" with a custom value

D) R/T view Tab

This screen describes the relationship between 2 system variables in relation to the X and Y axis.

The arrow located at the bottom-left corner shows the user which way to read the graph:

1. Standard: the input is on the X-axis (in this case, flow) and the output on the Y-axis (in this case, actuated pilot command for a targeted downstream pressure).



This screen illustrates that as the flow increases, the motorized control pilot will increase the output pressure according to the graph.

- Reverse: the input is on the Y-axis (in this case, Reservoir/Tank Level) and the output on the X-axis (in this case, Target Flow)



This screen describes that as the reservoir level decreases, the targeted flow (to fill the reservoir) increases, and the motorized control will act accordingly.



: The light on the bottom right of the screen indicates whether the control curve is active (green light) or inactive (red light).

E) Adjustment Tab



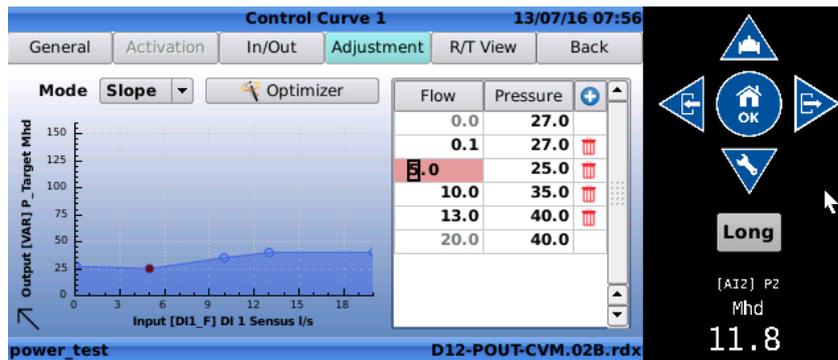
The control curve can be completely customised by inserting the required values in the table of the "Adjustment" tab.

Using  and  (standard), or  and  (reversed), navigate between each of the points on the table. The currently selected point is filled in red, while other points are not filled.

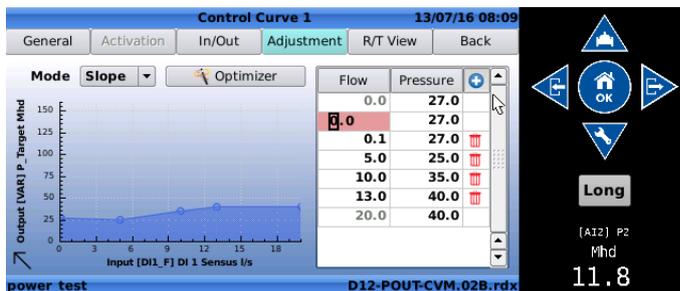
While on a point, click  to change the value.

See below for a detailed explanation of how to use each of the tools to make changes to the standard curve.

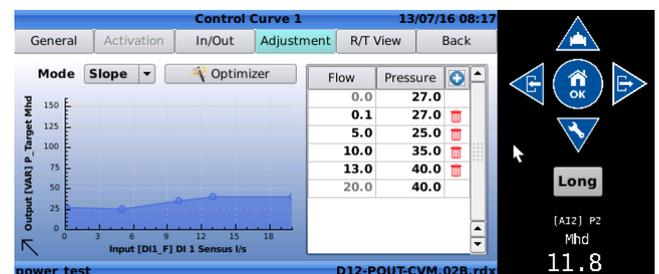
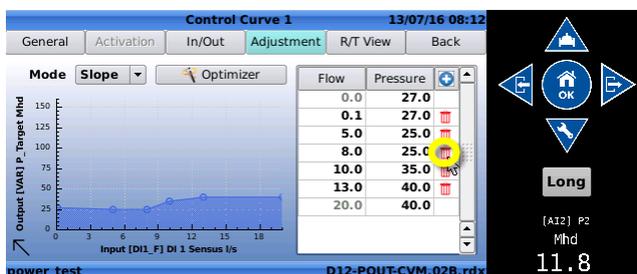
- **"Edit this point"**: Edit the currently selected point. When the cell is highlighted in red, the point is in edit mode. Enter the adequate values using the arrow keys, and then click  to validate the value.



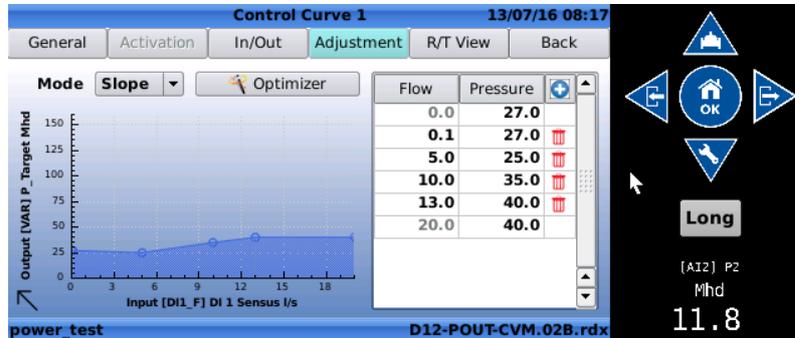
- **"Add one point"**: Click on  to add a point on the control curve then edit point



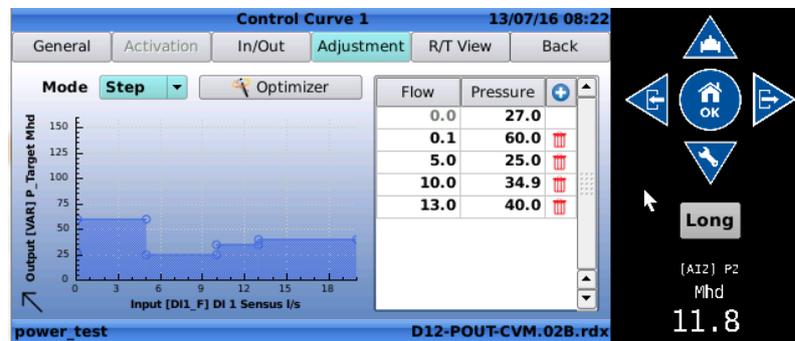
- **"Delete this point"**: Click on  to delete the selected point



- "Mode Slope": A direct line is made between each point, as shown below:



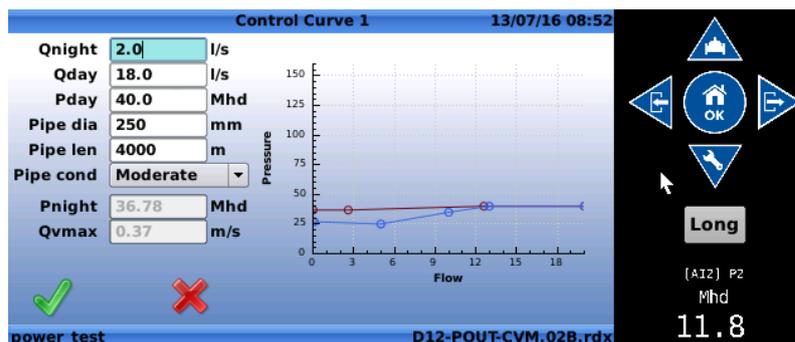
- "Mode Step": A split step line is made between each point, as shown below:



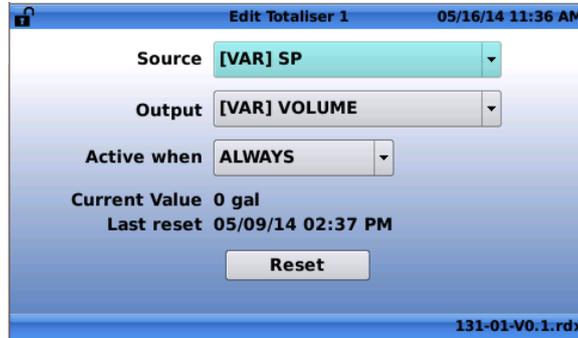
- "Optimiser":



This function is only available in pressure control mode.



3.3.5.6 Valve configuration - "Totalizer Menu"



Input Field Description:

- "Source": Designates which input should be used as the source for the totalizer count
- "Output": Designates where the total should be sent after it is calculated
- "Active when": Designates when the totalizer should be active
 - "Always": The totalizer will always be on
 - "[AI1]": Conditional based on input;

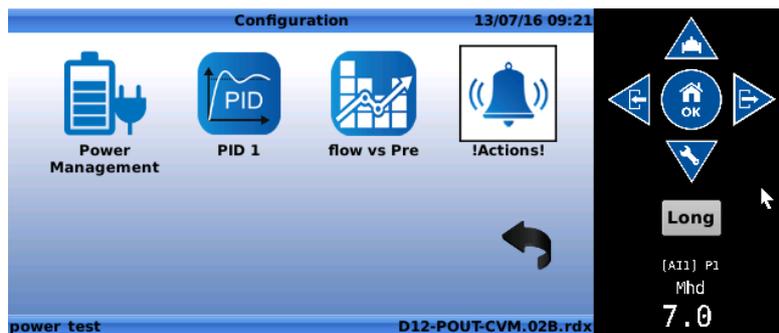
Example below:



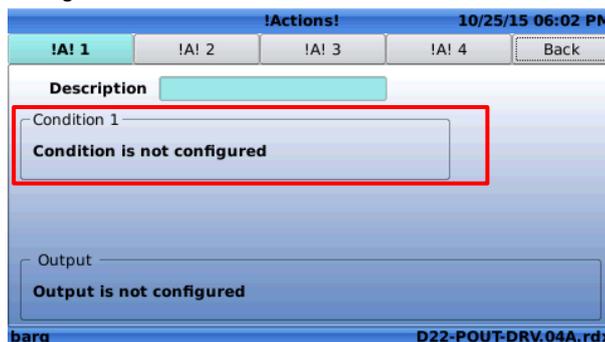
This totalizer is set to be active when the [AI1] Setpoint is greater than 10.00

- "Reset": This toggle button resets the totalizer to zero.

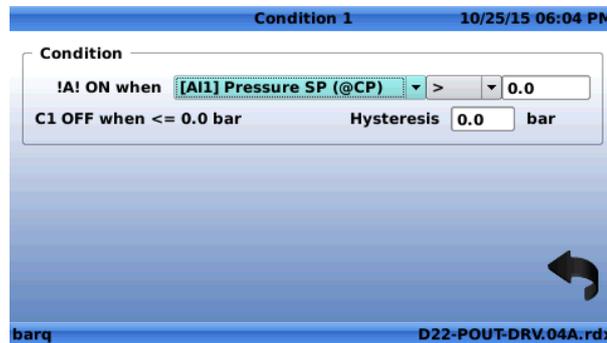
3.3.5.7 Valve configuration - "Actions Menu"



Click  on the "Condition" to configure the condition.

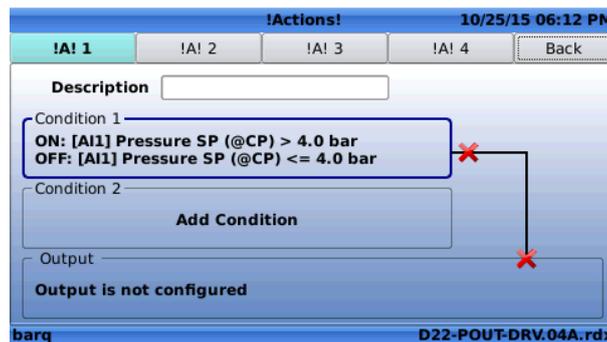


In the condition menu, configure the condition to apply the action.

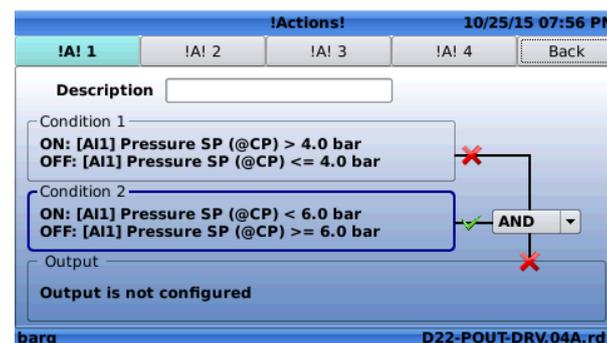


Input Field Description:

- **"Description"**: Use this field to choose a unique name for each input.
- **"!A! Enabled"**: Designates that this action is enabled or disabled.
- **"!A! ON when"**: Conditional field that designates when this action is active, according to the value and operator used.
- **"Hysteresis"**: Set up a hysteresis band.

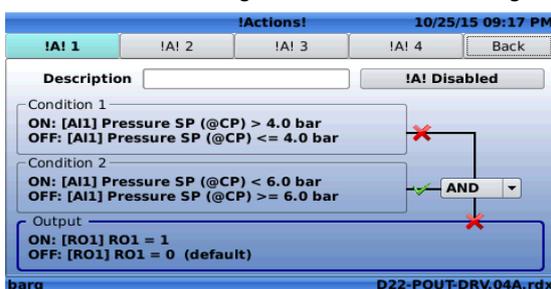
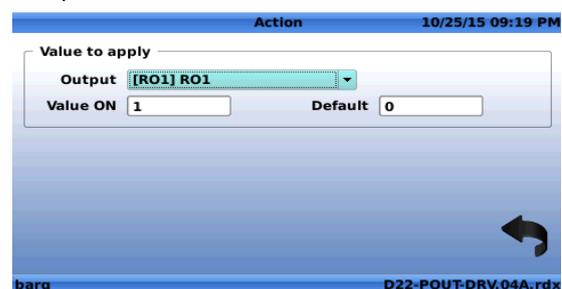


Up to two conditions can be set for an action, and the user can configure a condition "AND" or "OR" on the two conditions to apply an action, as per the following example.



The  icon is displayed when a condition is filled, and the  when it is not filled.

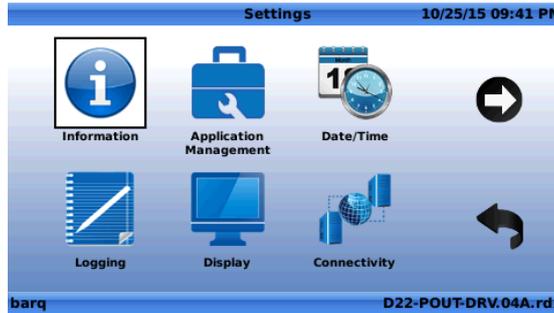
Once the conditions are configured, the user shall designate which output to take the action on

Input Field Description:

- "Output": Designates which of the outputs to take action on.
- "Value ON": Designates the value to apply to the selected output.
- "Default": Designates the default value of that action - which will be applied while the action is in the "OFF" state.

3.3.6 "SETTINGS" MENU



3.3.6.1 "Information" Page

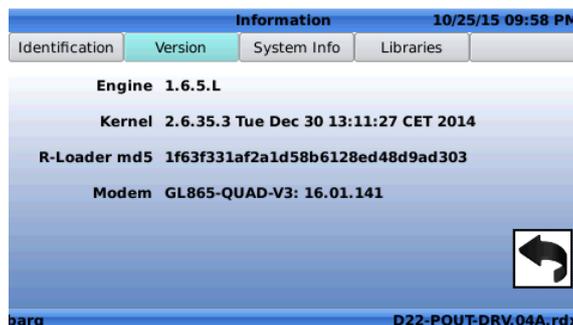
A) "Identification Tab"



Device identification information with "S/N (IMEI)" the serial number of the device, and "SIM (ICCID)" the SIM card identification number.

Input Field Description:

- "HostName": Use this field to assign a host name to the device. The default host name of the device is of the form *D12-serial number*
- "Contact": Use this field to enter an email valid email address for the use of the *Link2Valves™* data visualisation web interface
- "Location": Use this field to enter the location of the device
- "Order ID": Use this field to enter the Order ID
- "Version Tab"



This page shows information regarding the low-level software loaded in the Electronic Controller.

B) "System Info Tab"



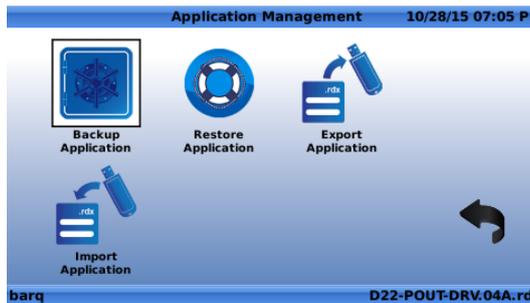
This page shows information concerning various system settings, such as Uptime or RAM usage.

C) "Libraries Tab"



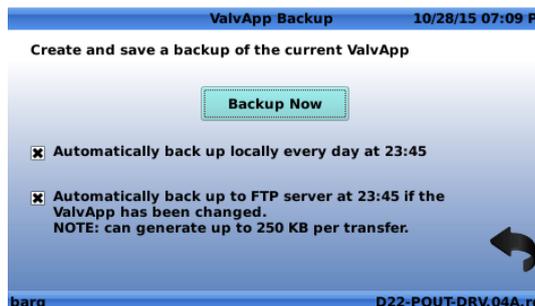
From this page, the user can access the libraries of standard **ValvApps™**.

3.3.6.2 "Application Management" Page



A) "Backup Application"

When the "Backup Application"  icon is selected, the following dialog box appears:



- **"Backup Now"**: Click on this button to manually back up the application
- **"Automatically back up locally every day at 23:45"**: Check (resp. un-check) the box to activate (resp. deactivate) an automatic backup of the current **ValvApps™** stored locally in the machine daily
- **"Automatically back up to FTP server at 23:45 if the ValvApps has been changed"**: Check (resp. un-check) the box to activate (resp. deactivate) an automatic backup of the current **ValvApps™** stored to the configured FTP server. This back up will happen only if the **ValvApps™** has been modified.

 This function can generate important data transfer (up to 250 kB) depending on the application.

B) "Restore Application"

When the **"Restore Application"**  icon is selected, the following screen appears, showing the available backup files that can be restored:



In the directory screen, click the  button to enter a folder, and the  button to navigate to the parent directory.

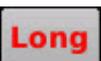
Select the appropriate file to restore, then click . The following dialog box will appear to confirm your choice:



Select **"Yes"** to restore to the chosen backup file. Select **"No"** to cancel the backup.

From the **"Restore Backup"** Screen, click the  button to return to the previous menu.



A click on  then click on  button returns to the main menu and cancel out of the menu.

C) "Export Application"

 In order to use the functionality of the **"Export Application"** function, ensure that either a USB flash drive is inserted into the USB-A Slot of the D12 Electronic Controller, and/or an FTP server is setup in the device.

When the **"Export Application"**  icon is selected, the following screen appears to show the directory of the USB drive inserted into the D12.



When exporting the application to the server, the *.rdx file will be pushed to the FTP server configured in the Electronic Controller in the "SYNClUP" folder.



In the directory screen, click the  button to enter a folder, and the  button to navigate to the parent directory.



Click the  button to export the application to the current location. The following dialog box will appear to confirm the selection:



- Select "Yes" to export to the chosen .rdx file
- Select "No" to cancel the export

From the "Export to USB" screen, click the  button to return to the previous menu.



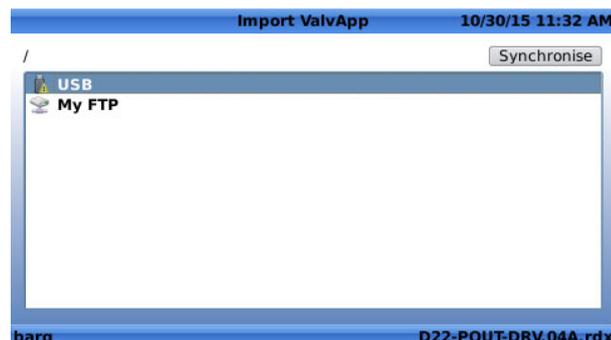
A click on button  then on  button returns to the main menu and cancel out of the menu.

D) "Import Application"



In order to use the functionality of the "Import Application" function, ensure that a USB Flash drive or is inserted into the USB-A slot of the Electronic Controller, and/or an FTP server is setup in the device.

When the "Import Application"  icon is selected, the following screen appears to show the directory of the USB drive inserted into the Electronic Controller.



- **Remote update:** The application can be updated remotely via the FTP server configured in the device. To use this functionality, the *.rdx file needs to be put on the server "SYNCDOWN" folder.



In the directory screen, click the button to enter a folder, and the button to navigate to the parent directory.



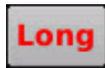
Click the button to load the selected file. The following dialog box will appear to confirm the selection:



- Select "Yes" to import the chosen *.rdx file
- Select "No" to cancel the import



From the Import from USB screen, click the button to return to the previous menu.

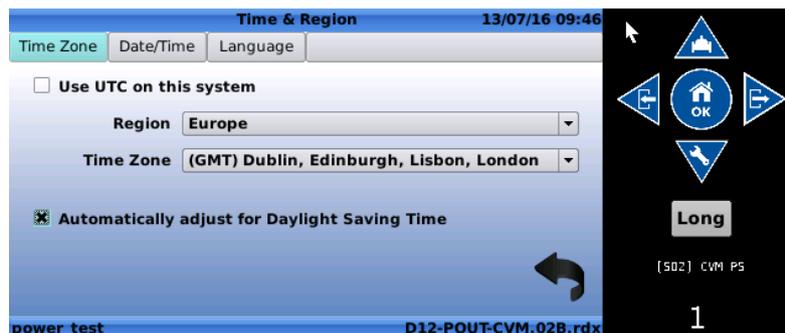


A click on button then on button returns to the main menu and cancel out of the menu.

3.3.6.3 "Time & Region" Page

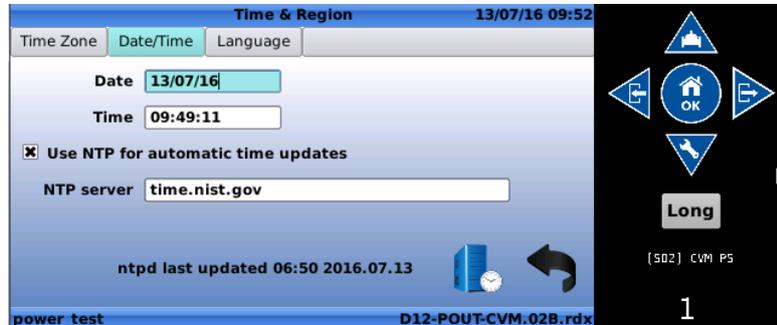


"Time Zone" tab: select to use UTC on this system (if flag on) or set the region and time zone (if flag is off)

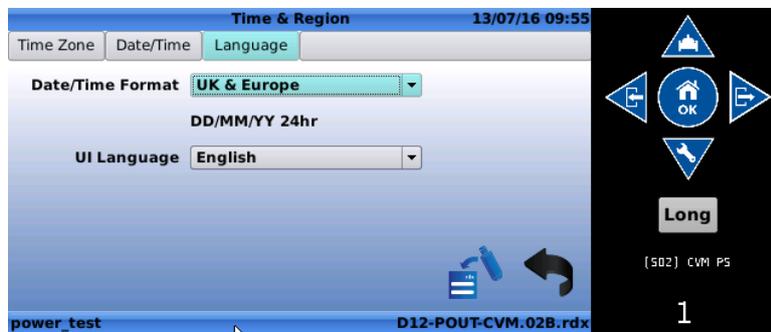


You can enable (if flag on) or disable (if flag off) automatically daylight saving time.

"Date/Time" tab : select to set manually the date / time or automatic by NTP server (if applicable & communication available).



"Language" tab: select to set the language and date/time format

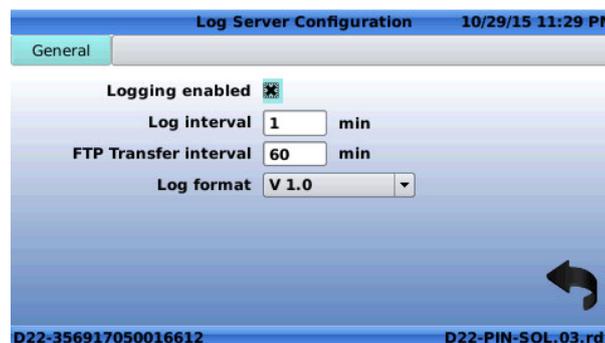


3.3.6.4 "Logging" Page



A) "Configuration"

Select the  icon to enter the log configuration menu.



It is recommended to not change the logging parameters without assistance of an official CLA-VAL representative.

- **"Logging enabled"**: Check (resp. un-check) the box to activate (resp. deactivate) the logging of data
- **"Log interval"**: Defines the frequency at which data is saved in the internal memory of the device



Interval of less than a minute can result in a rapid overload of the memory.

- **"FTP Transfer interval"**: Defines the frequency at which saved data is transferred to the FTP server that has been configured in the device.



: Enter the value "0" to disable the transfer to the FTP server.

- **"Log format"**: Designate which format to use for the log files.
 - **"V1.0"**: Complete log format for devices with an R-Engine software version 1.7 or higher
 - **"Legacy"**: Allows the user to generate log files compatible with log files of devices with R-Engine software version lower than 1.7

B) "Export"



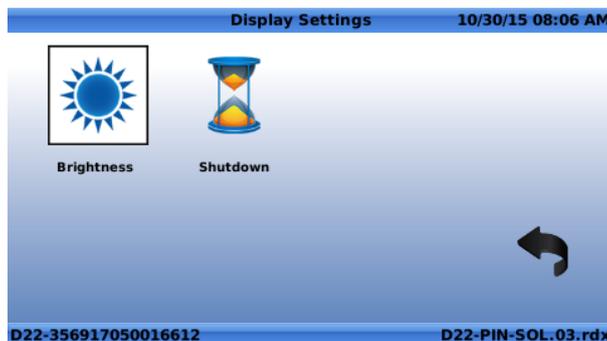
Select the icon to export log files to a USB drive or FTP server.



Choose from one of the options & select to export.

Select to export log files  and navigate to the place where to export the files.

3.3.6.5 "Display" Page

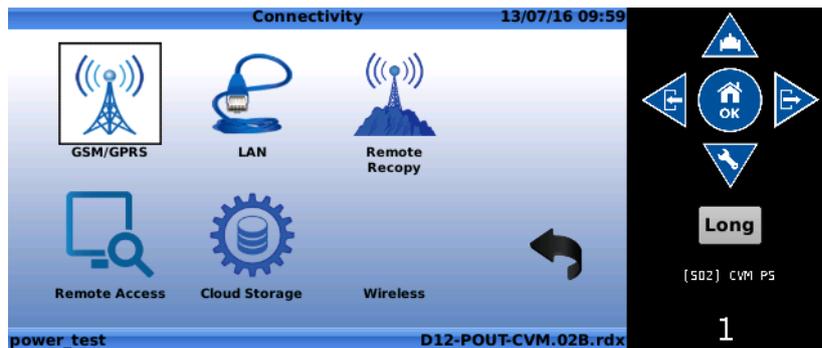


"Brightness": Select to set the screen brightness %. 100% is maximum, 1% is minimum.



"Shutdown": Select to set the shutdown time. 10 minutes is the default value which keeps the system on for a maximum of 10 minutes (Bluetooth and OLED display).

3.3.6.6 "Connectivity" Page



A) "GSM/GPRS"

When the **"GSM/GPRS"**  icon is selected, the following screen appears:



- **"GPRS" Tab:** Provides general information about the GPRS connectivity

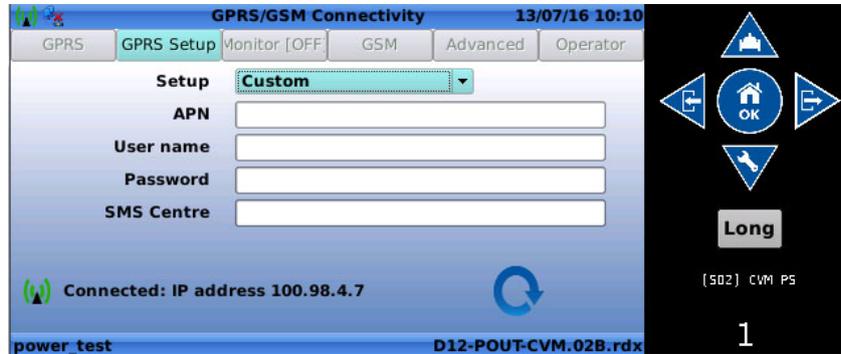


The  icon is displayed if the GPRS is connected, and the icon  when there is no GPRS connection.

- **"GPRS Setup" Tab:**

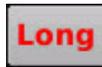


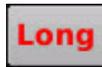
- **"Setup"**: Allows the user to choose between the CLA-VAL cloud servers (default) or a custom FTP server. When the **"Custom"** field is chosen, the following screen appears:



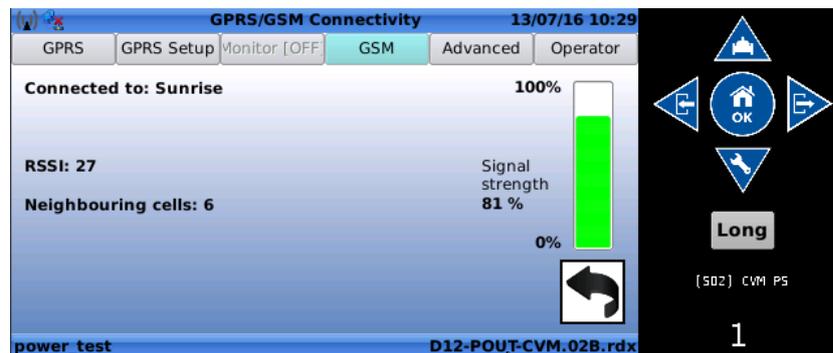
The input fields must be filled to set up the connection to the custom FTP server.

- When the "Refresh"  is hit, the following screen appears:



: A click on button  then on  button returns to the main menu IP and cancels out the operation.

- "GSM": This screen provides information regarding the GSM signal quality

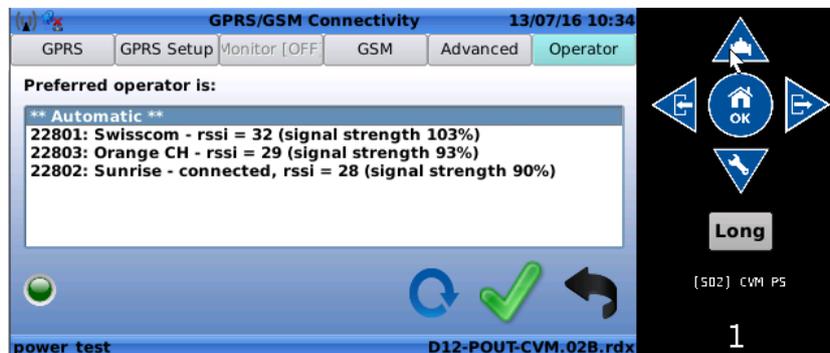


- "Advanced": This screen provides advance information regarding the GSM connectivity



LAC	BSIC	CI	Arfcn	RxLvl	C1	C2
1770	14	7A5B	1009	-55dbm	50	50
1770	51	7A59	9	-75dbm	30	30
4268	57	6A7F	7	-78dbm	27	21
1770	53	7A5A	1007	-83dbm	22	22
1770	10	627D	13	-93dbm	12	12
4268	50	6A7E	1004	-95dbm	10	4

- "Operator": This screen displays available network operators in the area.



Preferred operator is:

**** Automatic ****

- 22801: Swisscom - rssi = 32 (signal strength 103%)
- 22803: Orange CH - rssi = 29 (signal strength 93%)
- 22802: Sunrise - connected, rssi = 28 (signal strength 90%)



: By default the device selects the best operator in area. A manual selection is possible, select the operator on the list



then click on the button . The operator selected should be activate at the next connection.

B) "Cloud Storage"



- "Configure" Tab:



Cloud Storage

Setup: Cla-Val Link2Valves

Server name: ftp.link2valves.com

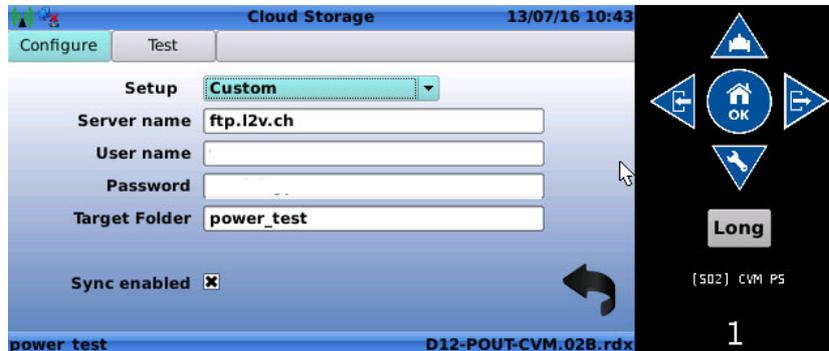
Registration e-mail: [] Register

Sync enabled:

Select whether to connect to a private FTP server ("Custom"), to the CLA-VAL servers ("CLA-VAL Link2Valves") or switch off. Then configure all the setting necessary to access an FTP server.



: If a connection to the CLA-VAL servers is preferred, a valid registration e-mail address is necessary.



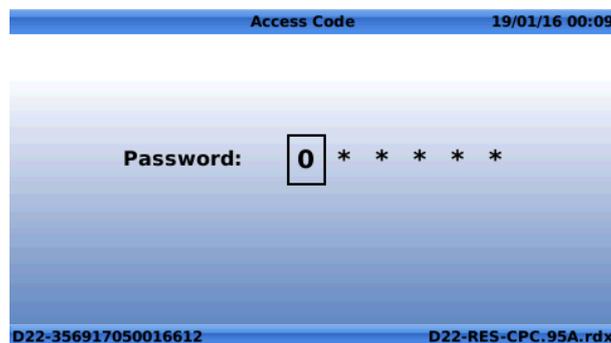
- "Test" Tab:

Go to the "Test" tab to check the connection to the FTP server. Click on the  icon to run the test again.

3.3.6.7 "Security" Page



This page allows the user to setup a password to access the Electronic Controller.



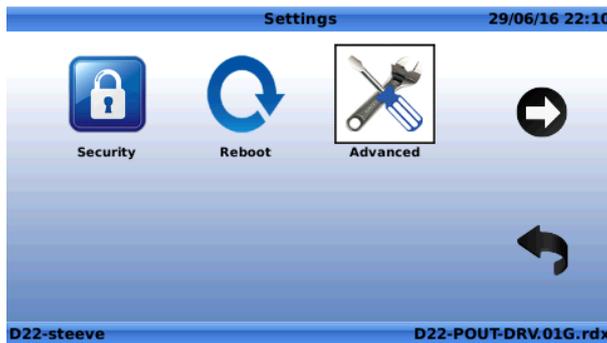
3.3.6.8 "Reboot"

Use this button to reboot the Electronic Controller whenever necessary.

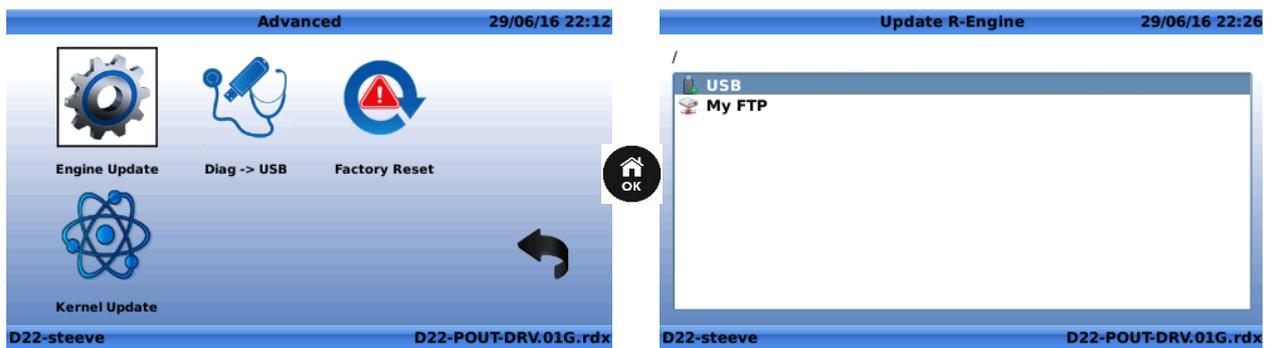


Once the system reboots, it will take approximately 45-120 seconds to restart.

3.3.6.9 "Advanced" Pages

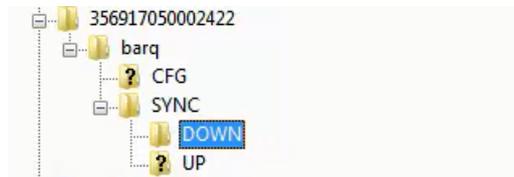


A) "Engine Update"



- USB: Click the  button to update from a USB Flash drive. If a USB Flash drive is inserted into the USB slot, then the Electronic Controller will show the contents of that drive. Navigate to the selected *.tar file and click  .
My FTP: If a server has been setup for connectivity, the update can be made from that server. Navigate to the selected *.tar file and click  .

The Engine needs to be located on the FTP server configured in the Electronic Controller in the "**SYNC\DOWN**" folder

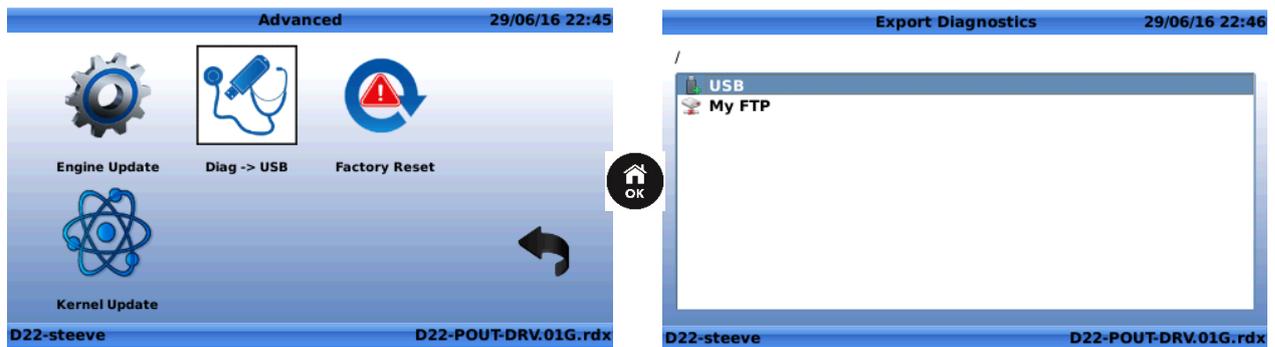


Engine update requires a *.tar file.

When navigating, click the  button to return to the previous level.

B) "Diag -> USB"

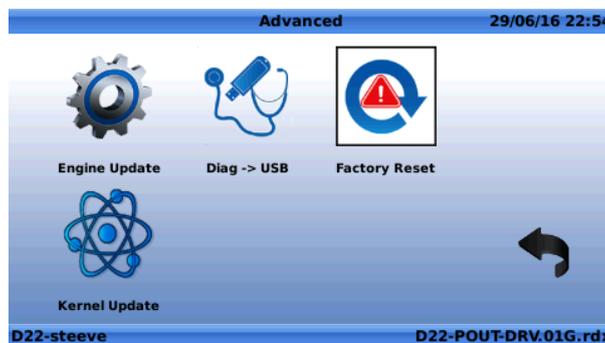
Allows the user to export the diagnostic file of the Electronic Controller. The diagnostic file cannot be used directly by the user, and is usually requested by CLA-VAL for support purposes.



- USB: Click the  button to export the diagnostic file to a USB Flash drive. Navigate to the selected *.tar file and click .
- My FTP: If a server has been setup for connectivity, the file can be exported to that server.

When navigating, click the  button to return to the previous level.

C) "Factory Reset"

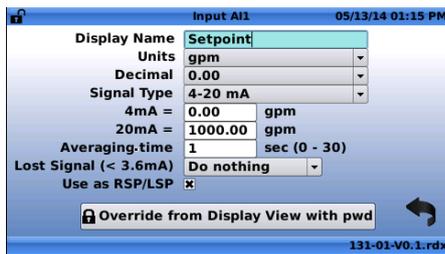


When clicking on the  icon, the following dialog box will appear to confirm the factory reset:



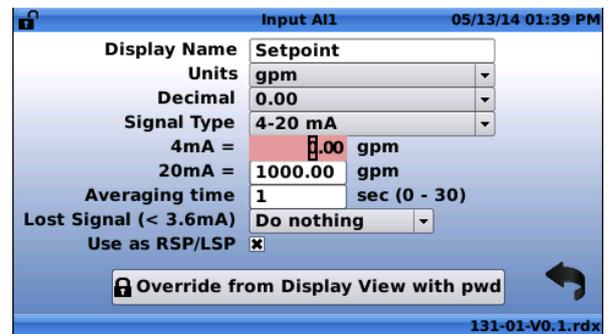
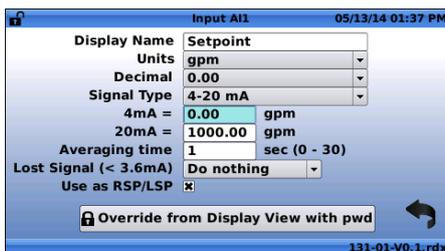
3.4 IN-MENU NAVIGATION

3.4.1 KEYBOARD FUNCTIONALITY



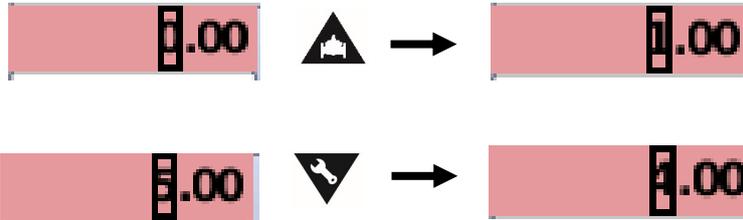
- Letter Selection - use arrow keys to navigate to letters and then press to select each letter.
- Deleting text - navigate to button and press to delete letters.
- Capital Letter (CAPS) Selection - select and press . The CAPS button will turn red - . Now all of the text in the window will appear in CAPITAL LETTERS.
- Accept text - navigate to the button and press to accept the text.
- Cancel text changes - navigate to button and press to cancel text changes.

3.4.2 NUMERAL SELECTION

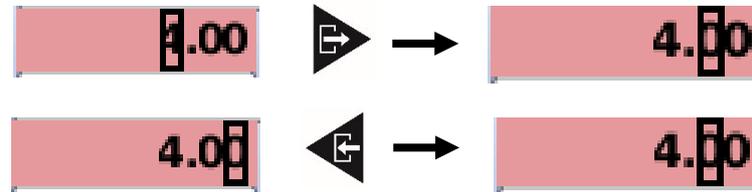


- Press to enter the numeral selection field.

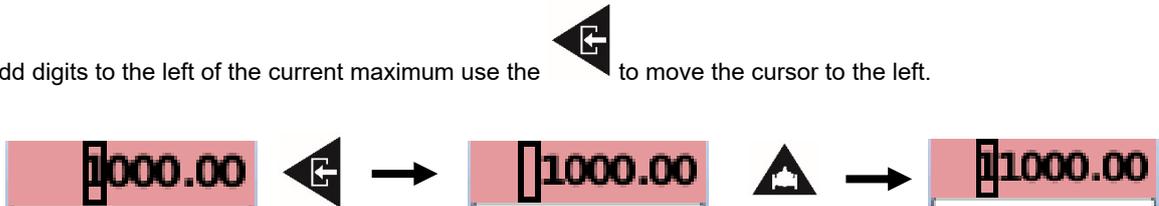
- Use and to increase and decrease the selected numeral.



- Use and to move the cursor to the left and right, respectively.

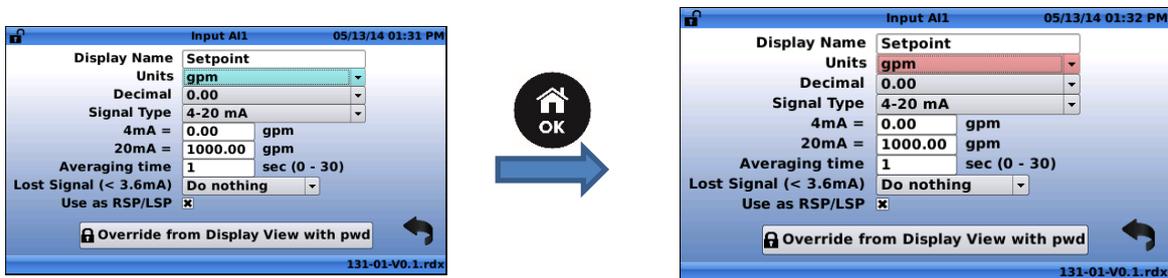


- To add digits to the left of the current maximum use the to move the cursor to the left.



- To accept changes, select to return to exit field.

3.4.3 DROP-DOWN MENU



- Use and to navigate up and down the options in the drop down menu.



etc...

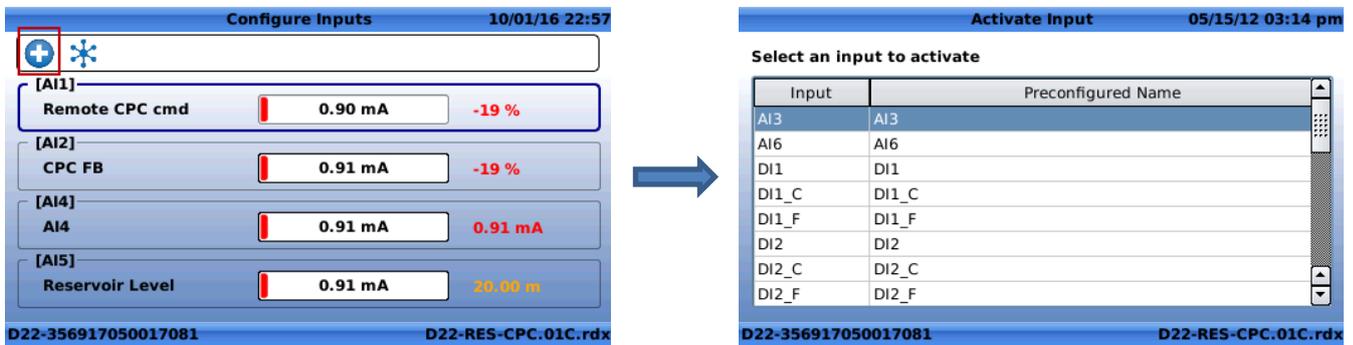
- Short click  to accept the selection.
- Long click  will escape to Home Screen and cancel any selections.

4 SPECIFIC FEATURES

4.1 ADD INPUTS ON-THE-FLY

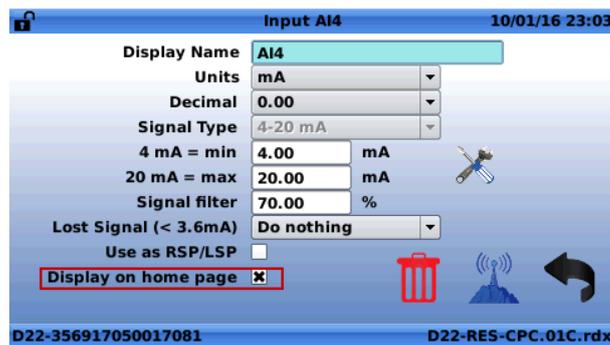
It is possible to add inputs on-the-fly in the Electronic Controller, even if these inputs are not originally included in the loaded **ValvApps™**, which is helpful if you need to add a sensor to the system for instance.

To add an input on-the-fly, you must go to the Inputs Configuration screen (button  then click left):



By clicking the "+" button, the input to be activated can be chosen from the list. The input added will then show up in the list of inputs on the configuration screen.

To display the added input in the home screen, go in the configuration of the added input:

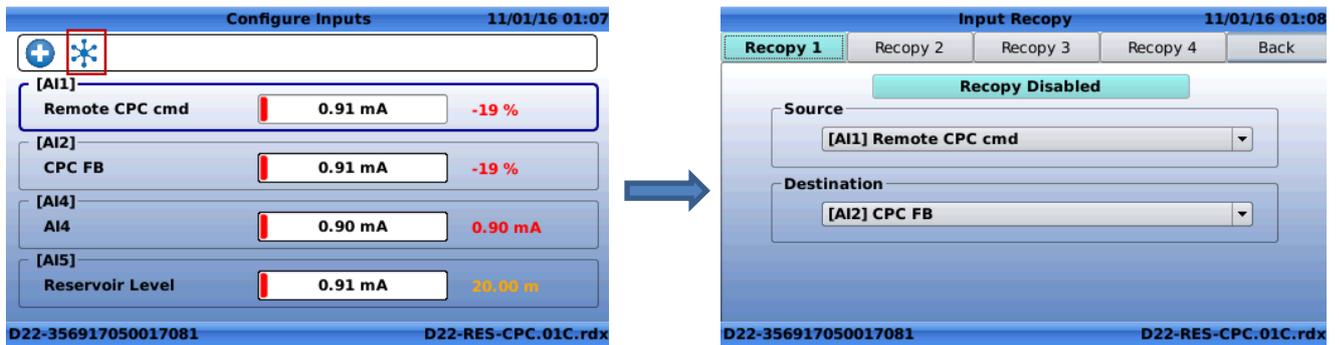


An added input can be deleted by clicking on the trash icon of the same screen.

4.2 INPUT REMAP (INPUT TYPE SELECTION)

This feature remaps an input to another, allowing for instance to add a pulse flowmeter even if the *ValvApps™* is not designed for it, without having to reconfigure the input.

This feature is available from the Inputs Configuration screen (button  then click left):



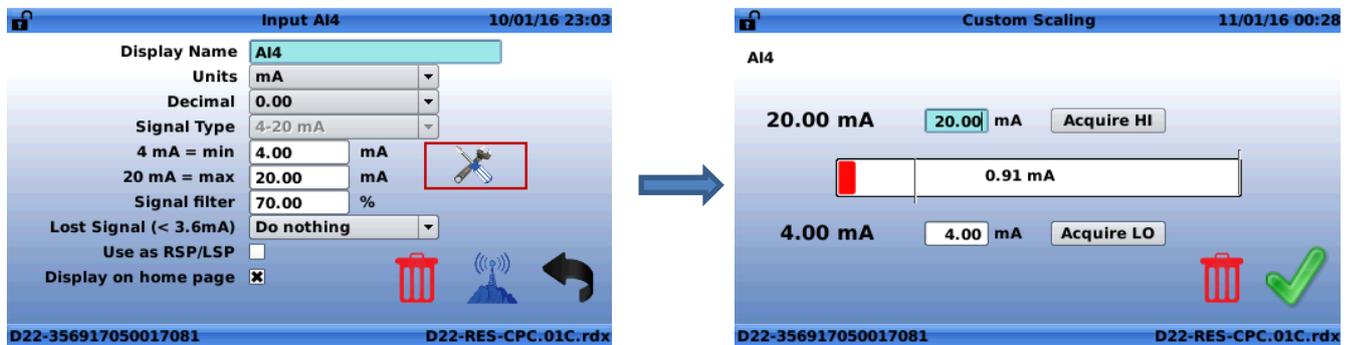
Note that only compatible inputs can be remapped, so the "Destination" will only show compatible inputs with the "Source".

4.3 CUSTOM SCALING

This feature is useful to re-scale signals of 4-20 mA sensors when the practical application range is reduced (say for instance 6-16 mA).

To custom scale an input, go to the Inputs Configuration screen:

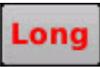
Button  then click left > Left on input to be custom scaled

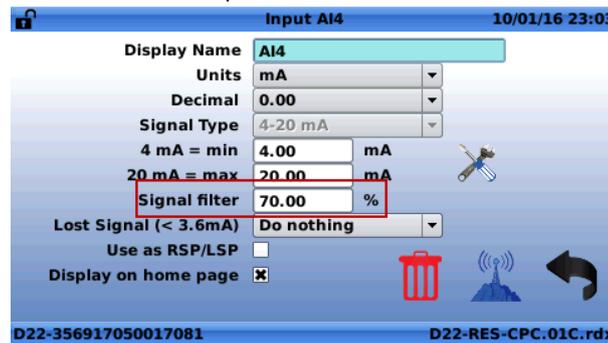


Push "Acquire Lo" to set the minimum value and "Acquire HI" to set the maximum value, and validate with the check mark. Note that the sensor can also have a reversed range, i.e. minimum physical value for 20 mA and maximum physical value for 4 mA.

4.4 INPUT FILTERING

Signal filtering has been added to the analogue inputs of the Electronic Controller to attenuate noise coming from the sensors, and stabilize the signal. The filter ratio can be set in the Inputs Configuration screen:

Button  then click left > Left on the selected input



The value can be set from 1% (light) to 99% (strong) or disabled. The default value is set at 70%, which is usually a good level of filtering for most applications.

Unless required and understood, this value should not be changed.

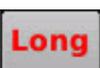
4.5 REMOTE CONFIGURATION

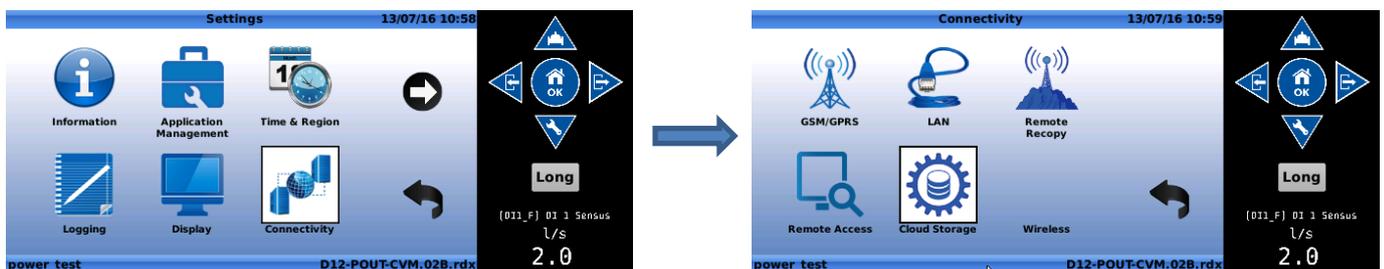
It is possible to edit and change: control curves, set-points, and values remotely from the configuration screen (short click down) via the CLA-VAL **Link2Valves** web platform. This feature sets a high value when needing to change the mode of operation or characteristics of the regulation profile, without having to send a technician in the field.

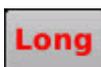
For instance, the mode of operation can be changed from a fixed pressure regulation to an automatic pressure vs. flow regulation profile, and/or could slowly adjust PRV outlet pressure set-point until the optimal point of the network is reached.

To use this functionality, the Electronic Controller needs to be connected to the internet (either via GPRS/GSM or via Ethernet), and registered in the CLA-VAL **Link2Valves** platform for a user with Administrator rights (contact CLA-VAL for more details).

4.5.1 REGISTER THE ELECTRONIC CONTROLLER ON LINK2VALVES

Button  then click down > "Connectivity" > "Cloud Storage"



Ensure that the communication is set to "Cla-Val Cloud" (requires a CLA-VAL SIM card) in button  then click down > "Connectivity" > "GPRS/GSM" > "GPRS Setup"

- Enter "Cla-Val Link2Valves" in "Setup"
- Enter email address in "Registration e-mail"
- Click on "Register" and wait for process to complete



4.5.2 CONNECT TO LINK2VALVES

If already registered in **Link2Valves**, connect to www.link2valves.com and log in.

If not registered, click on the automatic email received from *no-reply@link2valves.com* (check your spam box if not in your inbox) and enter a password in the website. Ask CLA-VAL to get administrator rights.



See the Link2Valves User Guide for more details on how to use the functionality of Link2Valves.