

User Manual





CLA-VAL MD35

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Autonomous Modulation Electronic Controller

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1 INTRODUCTION

1.1 PRECAUTIONS BEFORE STARTING

Installation and electrical connection should be carried out in accordance with local regulations and only by qualified technicians!

The protection level is guaranteed only if product has been installed by technicians instructed by CLA-VAL personnel and thereafter correctly maintained. During installation and maintenance, the inside of product must remain completely dry. Humidity may drastically shorten the life of the battery and electronics.

1.2 BATTERY

Do not connect or disconnect the battery of the product in hazardous locations such as a damp room.

The battery provided with the product is not rechargeable and must be disposed properly at end of life.

1.3 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.

1.4 ENVIRONMENTAL PROTECTION

The product is delivered with batteries marked with this symbol /



1.5 **TYPOGRAPHY**

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

- a. "Bold": Menu, command, tab and button
- b. BOLD ITALIC: Important information
- c. (1) or (A): Circled numbers and letters in the text refer to the parts described in Figure 1 and 2 respectively (example: Figure 1 page 5)



d.

Note: Indicates useful information and advice

e. Chicates safety advice that must be strictly followed

1.6 ACRONYMS

LED: Light Emitting Diode

NCR: Notification Claim Return

SMS: Short Messages Service

GPRS: General Packet Radio Service

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- (1) Body
- (2) Head (main board + front panel)
- (3) Antenna (optional)



Figure 1 MD35 parts

- (A) SIM Card connector
- (B) SD Card connector
- (C) Battery connector
- (D) Micro USB Connector
- (E) Tag connect (8 pin)
- (F) Memory battery coin holder coin



Figure 2 MD35 interfaces

3 WIRING CHARACTERISTICS

Refer to the MD3500 wiring diagram for connection details.





4 SENSOR MOUNTING

4.1 PRESSURE SENSORS

The pressure sensors can be mounted either vertically or horizontally.



4.2 METER WITH PULSE EMITTER

Any pulse emitter may be connected to the MD35 counter input if its electrical system has either a "Normally Open" or "Normally Closed" contact. For setting up the pulse emitter, refer to the meter manufacturer's instructions and the MD35 instructions located in the *MD3500* wiring diagram.



- Always connect meter last to avoid arbitrary pulse counts.
- In any case you can reset the counter in the user interface.

5 MD35 MOUNTING

When mounting a MD35 with sensors other than those provided by CLA-VAL, be careful not to damage or deform the housing in any way (warranty will become void).

5.1 CELLULAR NETWORK QUALITY

Check the cellular network quality at the installation location prior to installing the product.

Network strength indication from a cell phone gives initial information about signal reception quality on a site. For more accurate information, use the MD35 configuration mode to get the exact reception quality of the product. Refer to chapter 9.14 "Checking the quality of the network" for more details.

The MD35 configuration mode will indicate (amongst other things), the network reception quality as seen by the MD35 in dBm units. Installation is not recommended for signal quality under -95 dBm. As the cellular network quality may fluctuate strongly across the site, it is recommended to test at different locations.

If network quality at the installed location is not sufficient, it may be necessary to relocate the MD35 or extend its antenna with adequate CLA-VAL extension cables.

The minimum signal strength is - 80 dBm for optimum data communication at the valve level.

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5.1.1 NETWORK QUALITY BETWEEN -80 dBm and -95 dBm

If the signal quality at the valve level is between -80 dBm and -95 dBm, check if the MD35 can be installed closer to the well opening, while maintaining a maximum distance of 3 m to the pressure sensors. If this is not possible, an antenna extension with optional CLA-VAL antenna extension cables might be necessary.

5.1.2 NETWORK QUALITY LESS THAN -95 dBm

If the signal quality at the valve level is lower than -95 dBm, it is required to deport the antenna outside of the well. Please contact CLA-VAL for more information.

5.2 ORIENTATION IN SPACE

MD35 should be mounted in an upright position (antenna side up, cable gland down) to guarantee good cellular connectivity.

MD35 may have difficulties transmitting when submerged (e.g. in a manhole after rainfall). To guarantee reliable transmission it is recommended to install it as high as possible in the well.



5.3 WALL MOUNTED INSTALLATION



MD35 can be fixed on walls using the wall mounted bracket.

Drill the holes at the correct distance (72 mm) or use the lower housing as a drilling gauge.

5.3.1 DIN RACK MOUNTED INSTALLATION

► CI



An alternative optional bracket is available for electrical box installation.

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5.3.2 ORIENTABLE BRACKET INSTALLATION



An optional orientable wall-mounted or valve bracket for MD35 is also available.



5.3.3 STRANDARD INSTALLATION



The standard installation of the MD35 on the wall should be, as close as possible to the well opening, but not further than 3 m from the pressure sensor(s) connection(s) on the valve.

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CONNECTION 6

PULSE COUNTER 6 1



Refer to the meter manufacturer's product information for complete information about functionality and connectivity.

The counter contact ("Normally Open" or "Normally Closed") must be connected between Tx/Cnt and GND (refer to MD3500 wiring diagram).

7 **SIM CARD**

PREPARING THE SIM CARD 7.1

A 3FF/Micro-SIM format is necessary for data communication compatible with LTE cat-M1, NB-IoT, or GPRS. CLA-VAL can optionally provide a SIM card. If another SIM card than the one supplied by CLA-VAL is used refer to chapter 9.13 "Custom SIM Card" for configuration.

7.2 **INSERTING THE SIM CARD**

Insert the SIM card with the golden contacts facing downwards into the card holder. Refer to Figure 2 - Chapter 2 «MD35 Characteristics» and the symbol printed on the MD35 for correct SIM card orientation. The SIM card must be completely inserted into the card holder. If the card is overlapping the card holder after insertion, remove it and check the card's orientation.

Avoid touching the metal contacts to prevent grease buildup. If touched, clean them with a dry cloth or a cotton swab lightly moistened with isopropyl alcohol, then allow to dry before insertion.

8 STARTING OPERATION

MD35 ASSEMBLY 8.1

If the product has been opened before closing, ensure the inside of the housing and seal are clean and dry. The presence of dust or humidity when installing may damage the product.

- 1. Connect the antenna (3) to the product (if present) (1).
- 2. Insert the SIM card in the base (if present) (B).
- 3. Connect the external battery connector.
- Close the body (1) by rotating the head (2), see Figure 3 below, **2** Do not force closure! If the two parts of the 4 housing cannot be fit together properly, make sure there is no pinched cable or dust.





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8.2 OPERATING MODE

The MD35 has 3 modes of operation:

- "Standby" mode
- "Acquisition" mode
- "Configuration" mode
- In "Standby" mode you can remove the SIM card or SD card, as well as connect or disconnect physical inputs.

The "Acquisition" mode is the operating mode of the MD35. In this mode, the device acquires the signals from the connected sensors and saves them to the internal memory. If the data communication option is enabled, the recorded data is sent across the cellular network at the set interval time.

The "Configuration" mode is used to activate the WiFi local network generated by the device, to configure the MD35.



Figure 4 Logical diagram of switching from one mode of operation to another

8.3 ACTIVATING MD35

Once the following actions are performed

- $\hfill\square$ Connected the battery & installed the sensor.
- □ Inserted the SIM card (if not using the default CLA-VAL SIM card).
- □ Closed the housing.

Switch to "Acquisition" mode on your MD35 as indicated in Figure 4 (from "Standby" mode, press the button for 5 seconds).

8.4 INSTALLATION VALIDATION

The simplest and fastest way to verify the successful start of the product is to use the MD35 LED. The LED flashes green every 10 seconds when in "**Acquisition**" mode.



9 TOOL & CONFIGURATION

9.1 INSTALLATION CHECKUP

The MD35's user interface provides complete product parameters information such as sensor readings and cellular reception quality:

- 1. Activate "**Configuration**" mode on your MD35 as indicated in the previous section (from "**Acquisition**" mode, press the button for 5 seconds).
- 2. Connect your smartphone, tablet, or computer to the WiFi network generated by the MD35. The network has the **default name**: *MD35-< serial number>*

The default password is: MD35_< last 4 digits of the series serial number >

We strongly recommend changing the default password at first installation.



Note: The network generated by the MD35 has no Internet access. Any error messages about this can be ignored.

3. Enter the address <u>http://192.168.4.1</u> in your usual internet browser, or scan the following QR code using a QR code reading application:



- 4. After a few seconds, the configuration interface of your MD35 will be displayed on the default browser.
- 5. The home page displays the measured values in real time. It also contains the web browsing menu as well as other useful information of your MD35.



9.2 NAVIGATION MENUS

The user interface has dropdown menus to facilitate the readability of the interface. To access sub-menus, click on the icon \checkmark to the right of the menu if available. Menu without icon \checkmark don't have sub-menus.

When you click on the icon \checkmark , the other menus close.

To hide sub-menus, click on the icon 🔨 to the right of the menu if available.



CLA-VAL MD35

9.3 SIMPLIFIED / ADVANCED MODE

The advanced mode allows accessing configuration parameters requiring specific knowledge.

A Do not access the advanced mode without prior training or assistance from CLA-VAL personnel.

1. To access the "ADVANCED MODE", click on the icon at the top right of the interface.

≡ MD35_231110011					. چ	D 💥
	Input list Click on any input for more details and options	Output list Click on any output for more details and options	Variable list Click on any variable for more details and options	Your MD35	1.	
CLA-VAL ★ ↓ 1/0 ↓ 1/0 ↓ 1/0	Inputs Show disabled ports All (0.50) P1 0.00 bar Al2 (0.50) 4.00 V 0.00 bar Al2 (0.50) 4.00 V No value (01) 0 0	Outputs Show disabled ports S01 1 D0 0 D0 0 M35 0	Variables (VAR1 © Control curve 2) VAR1 15.55 bar (VAR2 © Control curve 1) VAR2 0.15 bar (VAR3) VAR3 0.00 bar			
Events	DITC O ADVANCED M	10DE		98. Sarial Number	31% (~3,575 days)	þ
ن Log off ٥ 26/04/2023 11:33:30	DITF DITF BATY BATY	avanced mode, where you will have access that require specific ke	nowledge and are normally hidden. Do you want to proceed?	IMEI: MAC:	359206105106140 34:ab:95:5a:a7:e8	
	BATSOC 98.31 %			Firmware:	v2.1.0	

- 2. A pop-up will open to confirm your choice.
- 3. Click on the "**OK**" button. You now have access to the advanced settings.

4. Click the icon again to exit the advanced mode.

At the end of your session, the advanced mode will automatically be deactivated.

Note: Some parameters require switching to "ADVANCED MODE". These settings are indicated in the manual by the following icon:

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9.4 BASIC SYSTEM SETTINGS

- 1. Click on the " System" menu.
- 2. Give your MD35 a name.
- 3. Select the language of the interface.
- 4. Select your time zone using the "DETECT" button. If the time zone is not detected automatically, you can choose it manually with the "Time Zone" drop-down menu.

		System Settings	Battery information
	2.	Name for this MD35 * MD35_231110011	98.26% (~3,573 days)
CLA-VA	[™] 3.	Language * English (GB)	Charge: 98.27 %
A Home	4.	Time Zone * UTC	Current: -0.14 A
X 1/0	~	Use an external power supply	Days left: ~3,573 days
o ValvApps™	~	SAVE SETTINGS	
Events		Configuration Import/Export	
Settings	^	Include Actions	
Logging		EXPORT CURRENT CONFIGURATION	
Connectivity		Choose a file	
System		IMPORT CONFIGURATION FILE	
し Log off			

- 5. Optional: Set the automatic synchronization of the unit's internal clock.
 - a. Choose a time synchronization server (NTP server). The address pool.ntp.org, corresponding to a publicly accessible server, can be used if you do not know an alternative.
 - b. Periodic synchronization is recommended.

This operation can only be performed if the MD35 is connected to the cellular network (option). If not, go directly to step 8.

6. Click on "SAVE NTP INFORMATION" to apply the changes.

System Settings A Home A U/0 A Home A U/0 A U/0 Configuration Import/Export B Settings Configuration Import/Export Configuration Import/Export Configuration Import/Export Configuration Import/Export D Log off 0 26/04/2023 11:8807	ed et ate and time a i

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7. Click on "SYNCHRONIZE NOW" to update your unit's clock immediately.

This operation can only be performed if the MD35 is connected to the cellular network (option). If not, go directly to step 8.

8. Check that the time displayed on the clock under the navigation menu is correct. If not, you can manually set the time in "Manually set date and time". Click on "SET DATE AND TIME" to have the change applied.

≡ MD35_231110011				🌧 🛇 🎽
Image: System System Image: System System Image: System Image: System Image: System <	Ale settings with an USDS * 8. 335,231110011 was * 0 * 20** 0 ETECT Use an external power supply LAKE SETTINGS Defiguration Import/Export Include Actions Exposit Constantion Doce a file • Ale out Constantion FILE	Advanced Manuality set date and time 264/2023 1 3 4 8 0 0 * Ext DATE AND TIME TYPE Property and the set of	Battery information Battery information 98.27% (~3.573 deps) Charge: 98.27% Voltage: 3.78 V Comment: 28 °C Days left: ~3.573 deps) Refresh battery information Information Intery capacity:* * 38 Ab * Or This button resets battery lifetime statistics and should only be used after a battery is replaced. RESET EXTERNENT	

9.5 INPUT/OUTPUT: COLOR CODING

A color code is used to indicate whether an input has reached its alert threshold or if the input or output has been forced to a predefined value by the user.

When an input reaches its alert threshold, its value appears in red.

When the input or output is forced, the value appears in dark blue.

nnute		Show disabled nor
		onon alcabica por
AII (0-5V)	0,014 V	5 00 bar

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9.6 ANALOGUE INPUT SETTINGS

9.6.1 CONFIGURATION

The inputs identified by Al1, Al2, Al3 and Al4 are analogue inputs.

1. Click on " \rightarrow **Inputs**" to display the input configuration page.



- 2. To activate an input that is not displayed on the list, select "Show disabled ports". The list will show disabled inputs with a *gray* background.
- 3. Click on an input to reach its configuration page.

≡ MD35_231110011		
	Input list Click on any input for more details and options Inputs Show disabled ports	2.
GLA-VAL	P1 0.00 bar	1
۰ ۲/۵	Al2 0.011 V No value	
→] Inputs	AI3 (0-5V) AI3 0.000 V No value	3.
[→ Outputs	Al4 (0-10V) Al4 0.000 V No value	
→ Variables		
	DI1 1	
≿ ValvApps™ ✓	DI2 DI2	
Events		
Settings V	DI1C reset 0.00 I	
U Log off	DI2C DI2C reset 0.00 I	
© 26/04/2023 11:34:02		



- 4. On the configuration page of the desired input, you have the possibility to change the name, and then configure the basic settings of the connected sensor.
- 5. S, additional sensor settings are available in "advanced mode".
- 6. ******, ****Lost Signal**" drop-down menu allows configuring an action when the sensor signal is lost. For example, when the ratiometric sensor voltage is less than 0.5 V.

You have the choice between:

- a. No Value
- b. A default Value
- c. The last Value
- 7. When done, click "SAVE" to apply your changes.

	Configuring P1	Cust	om scaling		Override P1	
CLA-VAL [®]	Enabled Name * P1	Scale mi 0.00 Scale ma 5.00	(V)*	ACQUIRE LO ACQUIRE HI	P1 Value (bar) * 0.00	0.01 b
Home	Decimal digits * 2 Units * bar	4.			OVERRIDE	
→] Inputs	Measurement min (bar) * 0 Measurement max (bar) *	0				
→ Outputs ✓ Variables	16 Sensor type * 0-5V	•				
ValveFlow*	Sensor warm-up (ms) * 25 Filter coefficient (%) * 30	5.				
Events	Lost signal * No Value	- 6.				

9.6.2 INPUT TEST

To test the proper functioning of an input, you can override its value:

- 1. After defining a desired value, click on "OVERRIDE", the forced value takes priority over the output.
- 2. To cancel the input override, click on "CANCEL".

When you exit the "Configuration" mode, all overridden inputs are automatically released.

	Configuring P1		Custom scaling			Override P1		
	In Enabled		Scale min (V) * 0.00	0	ACQUIRE	P1		0.01
CLA-VAL [®]	Name * P1		Scale max (V) * 5.00	\$	ACQUIRE HI	Value (bar) * 0.00		
Home	Decimal digits * 2	\$			1	• OVERRIDE CANCEL	2.	
I/O ^	Units * bar	.					_	
Inputs	Measurement min (bar) *	0						
 Outputs 	Measurement max (bar) * 16	\$						
Variables	Sensor type * 0-5V	· ·						
Set ValveFlow™	Sensor warm-up (ms) * 25	\$						
Valutana ^m	Filter coefficient (%) *							

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9.7 CONNECTING A FLOWMETER

Pulse meters must be connected to digital inputs (*DI1* or *DI2*). The configuration of these inputs *DIx* is broken down into two sub-inputs: DIxC, which provides volume information (C=COUNTER), and DIxF, which is flow rate information.

- The input **DixC** controls the display of the volume measurement.
- 1. Select the "**pulse weight**" for the flow meter and its units.
- 2. Set the initial value of the counter.
- 3. Click "SAVE" to apply the changes.

Contact	Counter	Flow	Pulse units	
			Pulse weight (l) *	
			1.00	
Name *				
DI1C				
Decimal digits *				
2				
<u></u>			<u> </u>	
Units				
1				
Index (I) *				
0.00		4		

The input *DIxF* controls the flow rate display.

- 1. Choose the pulse weight and its units. These options must match the connected flowmeter.
- 2. Choose the units in which the flow rate is displayed.
- 3. Set the maximum measurement value of the input.
- 4. 🛇
 - You can set the timeout before signal loss.
 - The "Signal Lost" dropdown menu allows you to configure an action when the sensor signal is lost. For example, when the voltage of the ratiometric sensor is less than 0.5 V. You have the choice to apply:
 - a. No value
 - b. A default value.
 - c. The last value.
- 5. Click "**SAVE**" to apply changes.

Contact Counter Flow Contact C	Pulse units I Pulse weight () * 1.00
Enabled Name * O O	Pulse weight (!) * 1.00
Name * O	
Decimal digits *	
2 	_
l/s	-
Measurement max (l/s) * 50	
Filter coefficient (%) *	
Timeout for signal loss (s) *	4
500	-
Lost signal * No Value	



9.8 SETTING THE PARAMETERS OF A SOLENOID

The outputs identified by SO1 and SO2 are solenoid outputs.

- 1. Click on the " → **Outputs**" menu to display the output configuration page.
- 2. To activate an output that is not displayed in the list, click on "Show disabled ports". The list will show the deactivated outputs with a *grey* background.

	≡ MD35_210426001	
		Output list Click on any output for more details and options
	CLA-VAL [®]	Outputs Show disabled ports 2.
	A Home	S01 0
	× 1/0 ^	DO 1 0
	→ Inputs	(M-35)
1.	[→ Outputs	M-35 0,11 %
	→ Variables	
	₩ ValveFlow™	
	► ValvApps~ ~	
	Events	
	Settings ~	
	U Log off	
	© 06/06/2023 12:35:56	



- 3. Click on an output to access its configuration page.
- 4. On the configuration page of the desired output, you have the possibility to change the name, the activation label, the deactivation label, and the default value.

9.8.1 OUTPUT TEST

To test the correct usage of a solenoid, you can force its state:

- 1. After selecting the desired state, click on "OVERRIDE", the forced state has priority over the output control.
- 2. To cancel the forcing of an output, click on "CANCEL".

When you exit the "Configuration" mode all outputs that have been forced are automatically released.

≡ MD35_231110011		
	Configuring SO1	Override SO1
CLA-VAL [®]	Enabled Name * SO1	S01 1 0 State *
	Label for value "I" * 1	
× 1/0 ^	Label for value '0' * O	OVERRIDE CANCEL 2.
→] Inputs	Default state * 0	
[→ Outputs	Pulse duration (ms) * 120	
← Variables	Battery security threshold (day) *	
ValveFlow [™]	SAVE CANCEL	
≿ ValvApps™ ✓		



9.9 SETTING THE PARAMETERS OF A M-35

The output identified by *M-35* is the dedicated output for the CLA-VAL motor.

The M-35 motor is a type of electric motor used to modulate a CLA-VAL automatic control valve.

- 1. Click on the " \rightarrow **Outputs**" menu to display the output configuration page.
- 2. To activate an output that is not displayed on the list, click on "Show disabled ports". The list will display the disabled outputs with a gray background.
- 3. Choose M-35.



9.9.1 CALIBRATION

1. To enter calibration mode, click on the "ENTER CALIBRATION" button. Only available in advanced mode

	Configuring M-35 M-35	Override M-35	
CLA-VAL [®]	General Calibration Configuration	M-35 Value (%) * 0,00	0,1
Home	Static Calibration	OVERRIDE CANCEL	
· 1/0 ^	Engine range (0%-100%)		
→] Inputs	Value at close position (%) 0,00		
E→ Outputs	Value at open position (%) 100,00		
← Variables	Enter Turns to Low Point (Turns) 0,00		
Set ValveFlow™	Enter Turns to High Point (Turns)		
ValvApps [™] ✓	9,00 Increase actuator		
Events 1.	ENTER CALIBRATION		
Settings 🗸			
Log off			

In this mode, it is no longer possible to manually adjust the motor position.

ତ



- 2. To fully close the pilot, click on the "Decrease actuator" button.
- 3. Once the pilot is fully closed, you can indicate the number of turns required to fully open the pilot.
- 4. You can also calibrate the motor directly from the open position by clicking on the "**Increase actuator**" button and wait for the pilot to fully open.

≡ MD35_210426001			≡ MD35_210426001	
	Configuring M-35 M-35			Configuring M-35 M-35
CLA-VAL [®]	General Calibration Configuration		CLA-VAL [®]	General Calibration Configuratio
Home	Static Calibration		A Home	Static Calibration
L 1/0	-Engine range (0%-100%)		^ ۷۷	%-%
→] Inputs	Value et close position (%) 0.00		→] Inputs	Value at close position (%) 0.00
[→ Outputs	100.00		C→ Outputs	Value at open position (%) 100.00
← Variables	Enter Turns to Low Point (Turns) * 0.00 🗘 Decrease actuator	2.	↔ Variables	Enter Turns to Low Point (Turns) * 0.00 C Decrease actuate
WalveFlow™	Enter Turns to High Point (Turns) *		Solution State	Enter Turns to High Point (Turns) *
valvApps™ ∽	increase actuator		► ValvApps~ ✓	9.00 Increase actuato
Events	SAVE CALIBRATION CANCEL CALIBRATION		Events	SAVE CALIBRATION CANCEL CALIBRATION
Settings 🗸			Settings 🗸	
) Log off			U Log off	
O 06/06/2023 12:59:16			Q 06/06/2023 12:59:45	

9.9.2 CONFIGURATION

The configuration page allows you accessing additional important information in read-only mode:

- The dead band of the motor in Tops.
- The maximum current in mA that the engine can consume before stopping.

	Configuring M-35 M-35	Override M-35
	General Calibration Configuration	M-35 0.11 %
ULA-VAL	Detetion and	0.00 O
A Home	Dead Band (Tops) 80.00	
1 /0 ^	Max Current (mA) 498.00	
→] Inputs		
[→ Outputs	-	
2		
← Variables		
← Variables <i>ValveFlow</i> [™]		

4.



9.9.3 UPDATE M-35 FIRMWARE

To update the M-35 motor firmware, it is necessary to use the product computer software CV33. Refer to the M-35 documentation for more details on how to use the CV33 computer software.

To power the engine and connect it to the CV33 software application:

- 1. Click on the "TURN ON M-35" button. By activating this mode, you will no longer be able to access the output tests and calibration.
- 2. When you are done with the CV33 software modification, you can click **"TURN OFF M-35**" to stop the motor. Additionally, the motor automatically turns off when you exit the Wi-Fi mode.

≡ MD35_210426001		
	Configuring M-35 M-35	Override M-35
CLA-VAL [®]	General Calibration Configuration	M-35 0.11 %
A Home	Enabled Name " M-35	OVERRIDE
1/0 ^		1 + 2
→] Inputs	SAVE CANCEL	1. + 2.
C→ Outputs		
← Variables		
ValveFlow [™]		
≿ ValvApps™ ✓		
Events		

9.9.4 OUTPUT TEST

To test the proper functioning of a motor M-35, you can manually force its position by following these steps:

- 1. Enter the desired position, then click on "OVERRIDE".
- 2. The forced position will have priority over the motor output. To cancel the override of an output, click "CANCEL".

≡ MD35_210426001		
	Configuring M-35 M-35	Override M-35
CLA-VAL	General Calibration Configuration	M-35 0.11 %
	✓ Enabled	
✿ Home	Name* M-35 1.	OVERRIDE CANCEL 2.
1/0 ^		
→] Inputs	SAVE CANCEL	
[→ Outputs		
← Variables		
≿ ValvApps™ ∽		
Events		
🖸 Settings 🗸		



CLA-VAL MD35

9.10 EVENT SETTING

Events are used to set alerts.

You can set two types of alerts:

- The high alarm is used to detect values above a threshold.
- The low alarm is used to detect values below a threshold.
- Alerts can be used to force data to be sent before the regular transmission time.
- 1. Click on "DE Events"
- 2. Click on the input you want to configure.
- 3. Select the threshold and return to normal value. Return to normal allows defining a dead band, avoiding oscillations between the active and inactive state.
- 4. Click "SAVE" to apply the changes.

	≡ MD35_231110011			≡ MD35_2311100	011	
	CLA-VAL 2.	Events Show disabled ports [Pf (411) 0.00 bar		CLA-VAL	® 3.	Too High Alert - P1 (Al1)
	1/0 V	 ○ Alert ▲ - Too high: 16.00-l/e (off-at-0.00-l/e) ○ Alert ▼ - Too low: 0.00-l/e (off at 8.00-l/s) 		A Home		8.00
1	≿ ValvApps [∞] ✓			λ Ι/Ο	.4 .	CANCEL
	Events	O Alert - Change of state		≿ ValvApps™	~	
	U Log off	0.001 ○ Alert ▲ - Threshold:		Events		

9.11 VALVEFLOW™ SETTING (OPTION)

The *ValveFlowTM* allows calculating the flow through a CLA-VAL valve, thanks to inlet pressure, outlet pressure, and valve opening.

- 1. Configure the ValveFlow by clicking on " StalveFlow™.
- 2. Select the inputs corresponding to the inlet/outlet pressure, as well as the opening.
- 3. Select the type of valve installed.
- 4. Click "SAVE" to apply the changes.

	≡ MD35_231110011			
		Configuring Flow Calculation	Advanced	
	CLA-VAL	Enabled Marrie * VFL0 Dacimal digits *	Choose a file	
	A Home	2 Units *	0	
	۸ ۱/۵	l/s	•	
	→ Inputs	Inlet pressure input * -	2.	
	[→ Outputs	Opening input *		
	← Variables	Flow Calculation data file * METRIC		
1.		Size * 32	3.	
	► ValvApps [™] ►	Body style * GE	•	
	Events	Seat type * Std		
	Settings V	CALE		
	U Log off			
	0 20/04/2023 11:49:30			
CLA-VAL Europe		www.cla-val.ch	cla-val@cla-val.ch	23 - MD35



9.12 VALVAPPS™

9.12.1 ACTIONS

* Action" allows you to activate or deactivate a solenoid valve according to its configuration and conditions. You can create up to 4 actions.

≡ MD35_231110011		
	Actions Inside	Actions Import/Export
	Type of application * Custom	EXPORT CURRENT ACTIONS
CLA-VAL [®]	Subtype of application *	Choose a file
A Home	Enabled	IMPORT ACTIONS FILE
X 1/0 ~	SAVE	
► ValvApps [™] ヘ		
Actions	Actions (0/4)	
Control curves	+	
N PID		
Events		
Settings 🗸		
U Log off		
© 26/04/2023 11:38:56		

9.12.1.1 Actions Inside

"Actions Inside" provides a catalogue of predefined hydraulic applications.

- 1. Select the "Type of application*" and the "Subtype of application*" according to your application needs.
- 2. Once selected, click on "LOAD". Now you can customize the predefined settings.
- 3. To activate the operation of the Actions, select the "Enabled" box.
- 4. Click on "SAVE".

≡ MD35_231110011		
1.	Actions Inside Type of application * Caugim	Actions Import/Export EXPORT CURRENT ACTIONS
CLA-VAL A Home 3.	· · · · · · · · · · · · · · · · · · ·	Choose a file B IMPORT ACTIONS FILE
× vo ⁴ .	SAVE LOAD 2.	
ValvApps" ^	Actions (0/4)	
Image Control curves✓ PID	+	
Events		
Settings 🗸		
U Log off © 26/04/2023 11:38:56		



9.12.1.2 Import/Export

Exportation/Importation allows you to export the list of actions that you have configured, as well as the different inputs/outputs impacted by these actions.

1. To export actions, click on "EXPORT CURENT ACTIONS".

Importation allows you to load the actions that you previously exported.

- Select the JSON file (.json) on your computer or mobile device. 2.
- 3. Click on "IMPORT ACTIONS FILE".

≡ MD35_231110011			
	Actions Inside	Actions Import/Export	
	Type of application * Custom	EXPORT CURRENT ACTIONS	1.
CLA-VAL [®]	Subtype of application *	Choose a file	2.
ft Home	Enabled	IMPORT ACTIONS FILE 3.	
× 1/0 ×	SAVE LOAD		
▶ ValvApps [™] ^			
Actions	Actions (0/4)		
Control curves	+		
N PID			
Events			
Settings 🗸			
U Log off			
© 26/04/2023 11:38:56			

9.12.1.3 Action Configuration

- Name: The action name.
- Output: The solenoid output which is controlled by this action.
- Activation state: The state of the solenoid when the action is active.
- Activation delay [s]: The activation delay allows adding a delay before the action is activated when these different .

conditions are met. Only available in advanced mode

Deactivation delay [s]: The deactivation delay allows adding a delay before the action is deactivated even if its •

conditions are no longer met. Only available in advanced mode

Max. duration of an activation [s]: The maximum time during which the action can be active, if it exceeds this time • the solenoid valve will deactivate and can reactivate only when the action deactivates and reactivates again. A

value of 0 disables this option. Only available in advanced mode

Priority (1 : High): When several actions control the same output, the priority defines which action will have control • over the output. The action with the value closest to 1 has priority, in case of a tie the order of the actions prevails.



CLA-VAL MD35

9.12.1.4 Conditions

Conditions determine when an action is active or inactive. You can set up to a maximum of three conditions per action. You can choose to join the conditions with "or logic" or "and logic".

The conditions available are:

- Threshold
- Calendar
- Volume + Calendar

≡ MD35_231110011		ə 0
	Action configuration	Chapter 9.12.1.3
GLA-VAL	Solution 1 Activation state* Sol1 (Sol1) 1 Priority (1: High)* 1	Chapter 3.12.1.3
↓ 1/0 ~	Send data immediately upon condition	
Actions Actions Actions	Conditions (1/3): Threahold P1 (Al1) > 0 bar	
Events	+	
Settings V	SAVE CANCEL	

9.12.1.4.1 Threshold

A condition that will be triggered by a condition applied to an analogue or digital input.

- Input: The value of the input used in the comparison.
- Operator: The operator used for comparison (larger, smaller, equal).
- Threshold [bar]: The constant used for comparison.
- Hysteresis [bar]: Allows defining a dead band.
- Minimum duration [s]: The maximum time the condition can be true. Set the value to 0 to disable this feature. Only available in advanced mode

	Action configuration	Condition configuration
	Enabled Name Action 1	Type* Threshold
Home	Cutput * Activation state * SO1 (SO1) Activation delay (s) * Deactivation delay (s) *	P1 (Al1) P1 (Al1) P1 (Al1) P1 0.02 bar Operator *
· 1/0 ~	0 0 C Max. active duration (s) * Priority (1: High) *	Threshold (bar)*
ValvApps™ ^	Send data immediately upon condition	
Actions	Conditions (1/3):	Minimum duration (s) *
Control curves	Threshold	0 0
N PID	P1 (Al1) > 0 bar	
Events	+	
Settings ~	SAVE CANCEL	
Log off		



9.12.1.4.2 Calendar

Condition that will trigger between a start time and an end time. Depending on the days of the week, and months.

- From: The time when the condition starts.
- To: The time when the condition ends.
- When?: The list of days and months where the condition is valid.

°	Action configuration		Condition configu	uration
CLA-VAL [®]	Enabled Name Action 1 Output *	Activation state *	Type * Calendar From: Hour * Mm	utes * Seconds
Home	SO1 (SO1) Activation delay (s) *	1 v Deactivation delay (s) *	00 👻 00	• 00 •
× 1/0 ~	0 C Max. active duration (s) * 0 C	0 0 Priority (1: High) * 1 0	To: Hour* Min 23 ~ 59	seconds 59 -
ValvApps ^	Send data immediately upor Conditions (1/3):	n condition	When?:	January
Control curves	Calendar		Tuesday	February
PID Events	From: 00:00:00 To: 23:59:59 7/7 day(s), 12/12 month(s) +	Î	WednesdayThursday	March April
Settings V	SAVE CANCEL		 Friday Saturday 	✓ May✓ June
り Log off			Sunday	July
© 26/04/2023 11:51:30				 August September
				Cctober
				November

9.12.1.4.3 Volume + Calendar

Condition that will be triggered according to a time of day and a month. And stop when a certain volume of water is reached.

- **From:** The time when the condition starts.
- Until: The volume of water after which the condition ends.
- **Input:** Selection of the counter input.
- Operator: The operator used for comparison (greater, greater, or equal).
- Threshold: The constant used for comparison.
- When?: The list of days and months when the condition is valid.

	Action configuration	Condition configuration
	Enabled Name Action 1	Type * Volume + Calendar
GLA-WALL Mome 1/0 ValvApps" Actions Actions PID Settings Settings Octored Settings Settings Octored	Attention stars * 1 Sof (201) Sof (2	
		Sunday Suby August September Cober



9.12.2 CONTROL CURVE

The menu " Control Curve" provides a simple method to establish a relationship between two variables in the system. The user can create this relationship graphically by linking pressure, flow, level, and/or time directly on the web interface using graphical functions. It is possible to create up to four (4) "Control Curves" to adapt the system specifically, such as for seasonal adjustment.

≡ MD35_231110011	
CLA-VAL	Control Curve List Click on any Control Curve for more details and options
 ♣ Home ↓ 1/0 ~ 	Control Curve 2 017
Vaivapps Actions	+
Events	
Settings V U Log off	
© 01/05/2023 07:02:34	

9.12.2.1 "General" Tab

Description of input fields:

- "Description": refers to a name for the control curve.
- "Status": indicates if the control curve is active.
 - o "On": The control curve is active.
 - \circ ~ "Off": The control curve is inactive.
 - **"Conditional"**: Condition based on an input or a variable.
 - o "Calendar": The control curve is activated according to calendar rules, which are defined in the "Activation" tab.
 - "Period": The control curve is activated according to days of the week and a period, which are defined in the "Activation" tab.

		configuring Control Curve ontrol Curve 1	1		
		General	Activation	In/Out	Adjustment
ULA-VA	AL	Description * Control Curve 1			
Home		Status *			
% 1/0	~	Pellou			
o ValvApps™	^				
Actions					
Control curv	es				
Events					
Settings	~				
Log off		SAVE			



9.12.2.2 "Activation" Tab

Description of input fields:

- "Day of the week": indicates which day(s) of the week the control curve is active.
- "Month of the year": indicates the months during which the selected days are active.
- "Period" section:
 - **"From"**: Date and time when the period begins.
 - "Until": Date and time when the period ends.

≡ MD35_231110011		
CLA-VAL [®]	Configuring Control Curve 1 Control Curve 1 General Activation	In/Out Adjustment
A Home	Monday Tuesday Wednesday] Thursday 📋 Friday 📄 Saturday 📄 Sunday
* 1/0 ~	Period From (DD/MM) 1/1	At (Hitmm) 0:0
NalvApps™ ^	Until (DD/MM)	At (Hitzmm)
Actions	1/1	0:0
Control curves		
Events		
Settings V		
U Log off	SAVE	
© 26/04/2023 11:40:57		

9.12.2.3 "In/Out" Tab

Description of input fields:

- "Input" section:
 - o "Source": indicates the location of the input.
- "Output" section:
 - o "Destination": indicates the location of the output.
 - o "Default value": the default value of the output in case of invalid input or disabled control curve.

	Co	ontrol Curve 1		
CLA-VAL	TM	General	In/Out	Adjustment
ULA-VAL		Source *		
Home		Time (Time)		
\$ 1/0	~	Output Destination *		
o ValvApps™	^	VAR2 (VAR2)		
Actions		1.00	On invalid input	On control curve disabled
Control curves				
Events				
Settings	~			
Log off		SAVE		



9.12.2.4 "Adjustment" Tab

≡ MD35_231110011			
	Configuring Control Curve 1 Control Curve 1		
	General In	/Out Adjustment	
ULA-VAL	Mode		
A Home	🔾 Step 💿 Slope		
• 1/0	Points:Time -> VAR2 (VAR2)		
× 1/0 •	00:00	0.00	0
▶ ValvApps™ ^	05:00	2.00	
Actions		2.00	<u> </u>
益 Control curves	07:00	8.00	i î
Events	11:00	11.00	0
🖸 Settings 🗸	18:00	10.00	° 🗇
U Log off	21:00	2.00	
© 01/05/2023 07:04:57	23:59	0.00	0
		+	
	SAVE		
	SAVE		

The control curve can be fully customized by entering the required values in the table in the "Adjustment" tab.

- "Add a point": Click on the "+" button to add a point on the control curve, then edit it.
- "Delete a point": Click on the "
- "Edit a point": To modify the input or output of a control curve point, click directly on the value you want to edit.
- "Slope Mode": A straight line is created between each point, as shown below:

	General	In/Out Adjustment		
CLA-VAL [®]	Mode			
Home	O Step Slope			Curve Chart R/T View History
I/0 ~	Points:Time -> VAR2 (VAR2)	0.00	0	Control Curve 1 Time (0060-035-39) Time (0060-03-04)
ValvApps" ^	05:00	2.00	^ -	12 11 10
Actions		2.00	~ 0	
Control curves	07:00	8.00	<u> </u>	a a (2)
Events	11:00	11.00	0	4
Settings 🗸	18:00	10.00	0	2 2
Log off	21:00	2.00	0 🗖	0 0000 05:20 06:40 10:00 13:20 16:40 20:00 23: Time (HH:MM)
© 01/05/2023 07:05:49	23:59	0.00	0	

CLA-VAL Europe



• "Step Mode": A stepped line is created between each point, as shown below:

■ MD35_231110011						÷ ۵ ،
	Configuring Control Curve	1				
	General	In/Out Adjustment		1		
CLA-VAL	Mode					
Home	Step Slope			Curve Chart	R/T View History	
V0 ~	Points:Time -> VAR2 (VAR2)				Control Curve 1	
ValvApps" ^	00:00	0.00	0	12	VAR2 (VAR2) [0-16]	
Actions	05:00	2.00	0	10	10	
Control curves	07:00	8.00	0	2) (bar)	•	
Events	11:00	11.00	0 0	ALE OAK		
Settings 🗸	18:00	10.00	0	2	2	2
Log off	21:00	2.00	0 🗖	0 00 00 03	20 06-40 10:00 13:20 16:40 2 Time (HR:MM)	9.00 23.20
© 01/05/2023 07:05:24	23:59	0.00	0			
		.+.				
	SAVE					

9.12.2.5 "Curve Chart" Tab

This tab allows to graphically visualize the control curve created from the points you have entered in the "Adjustment" tab.

≡ MD35_231110011		🗢 O 🧮
C	Configuring Control Curve 1 Control Curve 1	
CLA-VAL [®]	General In/Out Adjustment	
A Home	Step Siope	Curve Chart R/T View History
* vo ~	(Points: Time + VAR2 (VAR2)) (VAR2) 0.00 0.00 0.00	Control Curve 1 Time (90.00.28.59)
ValvApps" ^	0500 2.00 0	12 10 10 10 10 10 10 10 10 10 10 10 10 10
Actions Control curves	8.00 07.00	G (14)
Events	11.00 ©	9 0 4
Settings V	18:00 0 0	
也 Log off	21.00 0	9 06:00 68:20 06:40 10:00 18:20 16:40 29:00 28:20 Time (180:MM.)
© 01/05/2023.07:05:49	23.52 0.00 © +	

9.12.2.6 "R/T View" Tab

This tab displays in real-time the current position of the system output based on the input it is provided. This means that when the input changes, the graph updates the corresponding output position to reflect the latest information from the system.

≡ MD35_231110011				🗢 O 🎽
	Configuring Control Curve 1 Control Curve 1			
CLA-VAL	General In/	rOut Adjustment		
ft Home	O Step Slope			Curve Chart R/T View History
× 1/0 ~		0.00	0	Control Curve 1 Time (80:00-23:55)
ValvApps" ^				12
Actions	05:00	2.00	○ □	10
Control curves	07.00	8.00	0 0	3 (mm)
Events	11.00	11.00	0 🗇	0 2 000 2 000 4
Settings V	18:00	10.00	0 🙃	
U Log off	21:00	2.00	0 🗂	0 00:00 03:20 06:40 10:00 13:20 16:40 20:00 23:20 Time (HE/MM)
© 01/05/2023 07:06:19	23:59	0.00	0	
		+		
	SAVE			



9.12.2.7 "History" Tab

This tab allows displaying the history of output values over time.

	Control Curve 1			
CLA WAL	General	In/Out Adjustment		
GLA-VAL	Mode			
Home	🔿 Step 🔘 Slope			Curve Chart R/T View History
110	Points:Time -> VAR2 (VAR2))		12
1/0 V	00:00	0.00	0	
ValvApps'*				
	05:00	2.00	° 📅	S S B 3under, Apr 30, 19,96.00
Actions	07.00	0.00		E - Ualue : 5,78 bar
Control curves	0730	8.00	× 🛛	
Evente	11:00	11.00	0	= 3
Events				
Settings V	18:00	10.00	0	
l an all	21:00	2.00	0 8	0 09:00 12:00 15:00 18:00 21:00 1.May 03:00 06:00
Log on				TIME
© 01/05/2023 07:07:34	23:59	0.00	\$	
		+		

9.12.3 PID (PROPORTIONAL-INTEGRAL-DERIVATIVE)

The PID menu is only available in advanced mode.

The " PID" control system allows regulating the valve at a predefined set point. Up to four PIDS can be programmed, each offering the possibility of locally adjusting the set point. The M-35 provides real-time response and fine tuning based on variations in pressure and flow.

≡ MD35_231110011		
	PID list Click on any PID for more details and options	
Home	 D Set Point: DI1F FeedBack: Al2 ☆ Al2 > 50 	
► ValvApps [™] ^		
全 Actions		
PID Events		

9.12.3.1 "General" Tab

Description of input fields:

- 1. "Description": Use this field to choose a unique name for each PID loop.
- 2. "PID Type": Designate the type of hydraulic value:
 - a. "Flow": filters the setpoint and feedback using flow.
 - b. "Pressure": filters the setpoint and feedback control using pressure.
 - c. "Level": filters the setpoint and feedback using level.
 - d. "%": filters the setpoint and feedback using the valve position in percentage.
 - e. "Analog": filters the setpoint and feedback using flow.





- 3. "Cycle PID every (s)": This field indicates how often the calculation will be performed to determine the appropriate output command; the minimum value is 1 second.
- 4. "Signal loss": This field indicates the action that the M-35 will take in case of signal loss on the setpoint. The options are:
 - a. "No action".
 - b. "Open 100%": open the valve 100%.
 - c. "Close 100%": close the valve 100%.
 - "PID status": The user can configure a PID loop but not activate it until the appropriate time. The choices are:
 - a. "Enabled".

5.

- b. "Disabled".
- c. **"Conditional**": When "Conditional" is selected, an additional field appears and prompts the user to specify when the PID should be active. The following field is displayed:

≡ MD35_231110011					🗢 🕢 🎽
	Configuring PID 1 PID 1				
CLA-VAL [®]	General Description * PID 1	Inputs	Output	Adjustment	Zoning
✿ Home	PID Type * Flow				
↓ 1/0 🗸	PID Cycle every (s) * 15				0
≿ ValvApps™ ^	Signal loss * No Action				-
Actions	PID Status * Off				•
Control curves					
M PID	SAVE				
Events					

The PID loop can be configured when any of the inputs meet certain conditions. In this case, use the dropdown menu to select the appropriate input, then use the dropdown menu on the right to select an operator, such as the "Greater than" sign (>), then specify a value.

Example: The following PID loop has been configured to be conditionally enabled only when feedback [Al2] is greater than 50.00 l/s.

≡ MD35_231110011					🔹 🕓	M Iffine
	Configuring PID 1 PID 1					
CLA-VAL [®]	General Description * PID 1	Inputs	Output	Adjustment	Zoning	-
🔒 Home	PID Type * Flow					-
🗴 1/0 🗸	PID Cycle every (s) * 15				0	5
≿ ValvApps™ ^	Signal loss * No Action				÷	,
Actions	PID Status * Conditional				-	
an Control curves	Source *	Comparator *		Conditional Value (l/s) *	~	
N PID					~	-
Events	SAVE					
Settings V						

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9.12.3.2 "Inputs" Tab

Description of input fields:

- Setpoint section:
 - o "Source": Indicates which input or compatible variable should be used as the setpoint for the PID loop.
 - **"Ramp"**: Increases or decreases the setpoint over a period x when a new setpoint is entered to avoid overshooting or undershooting the target value.
- Feedback section:
 - o "Source": Indicates which input should be used as feedback for the PID loop.

≡ MD35_231110011					🗢 🕙 🎽
	Configuring PID 1 PID 1				
CLA-VAL	General	Inputs	Output	Adjustment	Zoning
ULA-VAL	Set Point				
A Home	Source * DI1F (DI1F)				•
1/0 v	Ramping * 0				0
► ValvApps [™] ^	Feedback Source *				
Actions	AI2 (AI2)				
Control curves	SAVE				
N PID					
Events					
Settings V					
U Log off					
© 26/04/2023 11:43:25					

9.12.3.3 "Output" Tab

Description of input fields:

- "Output Type": specifies the type of output used.
- "Output": designates the port used.

≡ MD35_231110011					🔷 🕢 🎽
	Configuring PID 1 PID 1				
	General	Inputs	Output	Adjustment	Zoning
✿ Home	0utput type * M35 Output * M35 (M35)				•
× 1/0 ~	SAVE				
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>					
Actions					
PID					
Events					
Settings V					
し Log off					
© 26/04/2023 11:44:24					



CLA-VAL MD35

9.12.3.4 "Adjustment" Tab

Description of input fields:

- "Zone number": designates which PID control zone is being adjusted.
- "Closing speed (%)": refers to the rate at which the valve can close. 1% is the slowest possible speed and 99% is the fastest possible speed.



 \mathcal{L} <u>Note</u>: actual closing time will depend on hydraulic conditions.

• "Opening speed (%)": refers to the rate at which the valve can open. 1% is the slowest possible speed and 99% is the fastest possible speed.



Note: actual opening time will depend on hydraulic conditions.

- "Deadband (I/s)": refers to the range of values around the setpoint where the M-35 will take no action.
 <u>Example</u>: If the setpoint is 50 I/s and the deadband is set to 2 I/s, the controller will take no action for feedback values between 48 I/s and 52 I/s.
- "Integral (s)": this value is used for fine-tuning very sensitive systems.

It is not recommended to use it without contacting CLA-VAL technical support!

• "Derivative (s)": this value is used for fine-tuning very sensitive systems.

It is not recommended to use it without contacting CLA-VAL technical support!

≡ MD35_231110011		🔹 🕄 🎽
	Configuring PID 1 PID 1	
CLA-VAL [®]	General Inputs Output Adjustment Zoning	
A Home		
X 1/0 ~	Opening speed (h) * 50	
ValvApps [™] ^	Desthand (In) * 0.05	0
Actions	Integral (s) *	10
Control curves	 Derivative (s) *	
N PID	<u> </u>	
Events	SAVE	
Settings V		
U Log off		
© 10/05/2023 07:39:39		



9.12.3.5 "Zoning" Tab

Description of input fields:

• "Number of zones": indicates the number of PID control zones to create.

Note: when multiple PID control zones are created, the active range of each loop is designated by an equal division of the total feedback range, as illustrated below:

≡ MD35_231110011					🗢 🕙 🎽
	Configuring PID 1 PID 1				
CLA-VAL [®]	General Number of zones	Inputs	Output	Adjustment	Zoning
A Home	<u> </u>		Feedback 0 - 100 l/s	s	·
X 1/0 ~	Zone 1 (l/s) 0.00				\$
NalvApps™ ^	To (I/s) 100.00				٥
Actions	CAVE				
Control curves	SAVE				
N PID					

The active range for zones 1, 2, and 3 each represent one-third of the total feedback range. These values can be specified by modifying the values of each zone, according to the user's needs.

- "Zone 1 (I/s)": designates the top of the range for zone 1 (the lower range is limited by the minimum of the feedback scale).
- "Zone 2 (I/s)": designates the lower and upper range of zone 2.
- "Zone 3 (I/s)": designates the lower range of zone 3 (the top of the range is limited by the maximum of the feedback scale).

≡ MD35_231110011					🌍 📀 🎽
	Configuring PID 1 PID 1				
CLA-VAL	General	Inputs	Output	Adjustment	Zoning
	Number of zones				
Home			Feedback 0 - 100 l/s	5	
🖈 1/0 🗸	Zone 1 (Vs) 0.00				0
NalvApps 🕆 🔹	To (I/s) * 33.33				0
Actions	Zone 2 (Vs) *				
a Control curves	33.33				0
M PID	To (I/s) * 66.67				0
Events	Zone 3 (l/s) * 66.67				0
Settings 🗸	To (Us) 100.00				0
ப் Log off	SAVE				
③ 26/04/2023 11:46:45					



9.13 CUSTOM SIM CARD (COMMUNICATION OPTION)

- 1. Click on " **Connectivity**" menu.
- 2. Enter the APN information of your SIM card (provided by your network operator).
- 3. Choose whether you want to communicate in 4G / 2G (Fallback in 2G in case of unavailability of 4G), 4G only, or 2G only and the 4G technology (CAT-M1 or NB-IoT).

≡ MD35_231110011				•
	WiFi access point settings	Data transfer	Modem status Offline 🞽	Mobile Network list
CLA-VAL	Duration of WFI activation (Intended) * [6] WFI network name (SSR) *	 None FTP ● Ø ØLink2Valves: 	Latest refresh: 26 Apr 2023, 11.48.08 Connected to: Swisscore (46 CAT M1).+1 IME: 3569542342561 ICCID: 59410120280709024975 RSSIVER:-8 dib(m) 0.2.0.4% Last error: No error occurred	Latest scan - No Mobile Networks Found
 ♣ Home ↓ I/0 ~ 	SAVE	Transfer Interval (min) 1.440	TEST CONNECTION	all Excellent II Good [51,70] dBm III [70,85] dBm
ValvApps" Events	Password *	Starting at: Nor" 00	Use Cla-Val SIM card 46/26 (1) 46 (26)	al [es,100]dBm al [100,]dBm 3.
Settings ^	Confirm password * Passwords must match cHANGE PASSWORD	Link2Valves user e-mail * REGISTER NOW	CATMI \\ NBHOT	
ConnectivitySystem	1.	SAVE	APN * APN usemame	2.
U Log off © 10/05/2023 07:41:15			APN password	
			SAVE	

4. Click the "SAVE" button in the "SIM card settings" section to apply the configuration.

SIM card settings		
Use Cla-Val SIM card		
● 4G/2G ○ 4G ○) 2G	
• CAT-M1 • NB-10	r.	
Data communication region * Europe		
^{APN*} internetm2m.air.com		
APN username		
APN password		

CLA-VAL Europe



9.14 CHECKING THE QUALITY OF THE NETWORK (COMMUNICATION OPTION)

- 1. Click on " Connectivity" menu.
- 2. Click on the button "TEST CONNECTION".

≡ MD35_231110011					
	Data transfer	Modem status Offline 🗙	Mobile Network list		
	O None	Latest refresh: 26 Apr 2023, 11:48:08 Connected to: Swisscom (4G CAT M1)	Latest scan: - No Mobile Networks Found		
CLA-VAL [®]	⊖ FTP	IMEI: 356995842342561 ICCID: 89410120280709624975 RSSI/BER: -81 dBm [0.2,0.4]%	SCAN NETWORK LIST		
A Home		TEST CONNECTION 2.	Signal quality legend		
↓ 1/0 ~	Transfer interval (min) 1440 C Transfer once per day	SIM card settings	Excellent Good [-51,-70] dBm II [-70,-85] dBm		
X ValvApps™ ✓	Starting at: Hour *	Use Cla-Val SIM card	I Fair [-85,-100] dBm II [-100,-] dBm		
Events	00 • 00 •	SAVE			
Settings	Link2Valves user e-mail * REGISTER NOW				
Logging					
Connectivity	SAVE SERU DATA				
System					
し Log off					
© 10/05/2023 07:42:11					

- 3. Wait until the mode is online and refresh the page (F5).
- 4. Check the dBm value by hovering over the network quality icon.



CLA-VAL Europe



9.15 REGISTER ON LINK2VALVES (COMMUNICATION OPTION)

Link2Valves[™] is the CLA-VAL web platform (<u>https://cla-val.ch</u>) that allows the remote access to your MD35. A Link2Valves account is necessary. Please contact CLA-VAL to get one for free if you don't have it yet.

- 1. Click on " **Transfers**" menu.
- 2. Under "Transfer List", click "Link2Valves".

G			Transfer list Click on any transfer for more details and options Server 1: Server 1: Server 2 Interval: 24h00 Reference time: 0h00
A	Home		
*	1/0	~	+
	ValvApps™	~	
	Events		
•	Settings	^	
	Logging		
Ŷ	Peering		
1. 🔋	Transfers		
ę	Connectivity		
\$	System		

3. Choose the transfer interval and the time when the transfer will start. This interval will determine the frequency of communications of the MD35 and Link2Valves. Please note that a faster interval will have a negative impact on the battery life and generate potential additional data communication costs.

Transfer	enabled			
Transfer interval (n 1440	in)	Tran	sfer once p	oer day
Starting at:			Minutes *	
00		•	00	
Link2Valves U	ser e-mail			
				REGISTER NOW

► CLA-VAL Europe



4. Associate the MD35 unit with your Link2Valves user account. First, enter the email address of your Link2Valves account. If you do not have one, please contact CLA-VAL to get one for free. Then click on "REGISTER NOW" and wait for the message "Success!".

	bied		
Transfer interval (min) 1440	🗸 Tra	nsfer once per d	ay
Starting at:		Minutes *	
00	-	00	
Link2Valves User (e-mail	R	EGISTER NOV

A Don't forget to click "SAVE" for your changes to take effect.

4

5

9.16 PEERING LINK2VALVES

The HTTPS Peering functionality enables two or more MD35 devices to connect, communicate, and exchange information with each other. This feature is especially useful in scenarios where measurements are taken far from the valve, such as when the reservoir is located remotely. In such cases, the MD35 positioned near the reservoir measures the level and sends this value to the MD35 controlling the valve. Based on these values, the controller activates the actuator to reach the desired setpoint.



► CLA-VAL Europe





To use this feature, the devices intended to communicate must be connected via Link2Valves.

- The first step is to configure the Peering functionality on L2V. To do so:
- 1. From the main Link2Valves page, click on the Peering option.

Link2Valves	=< ()	WHAT'S NO	W View -	Q Search		-	5	•		
										11.001
PLA-VAI"										11.885
LM-VAL										
DASHBOARD										11.881
TREE VIEW										11.001
DEVICES										11.001
DATA VIEWS										
EVENTS					-					11.885
CTCA1.2					-					
MANAGEMENT										11.883
PEERING										
TOOLS										11.885
RECYCLE BIN					-					
-										
2024 Cla-Val v4.16.14										
cy protection statement										
									-	0.000
		10.07.02			 	A.1.1. A.A W. A.A 14		****		

- 2. Click on "Add Subscription" to create a new communication between the two devices.
- 3. Select the device that will publish the data and the device that will receive the data.
- 4. Choose the inputs to be transmitted to the other device. For the publishing device, it is also possible to publish its outputs.
- 5. Finally, click the "Add Subscription" button.

2 Link 2 Valves	EK 🕢 WHAT'S NEW			
	PEERING SUBSCRIPTION			2 Add Subscription
	Publisher		Subscriber	
CLA-VAL [®]		T [VAR20]		
DASHBOARD	AIL_SIGIRINO	Signal stren		8
TREE VIEW		AI1 [AI1] AI2 [AI2]	A Publisher	
2 DEVICES				
DATA VIEWS	Z051789	P1 [AI1]	Subscriber 866	8
RVENTS	L 2051815	P2 (AI2)		8
PT MANAGEMENT			DAll Channels	-
T ₁ PEERING	L 2051815	P2 [AI2]	4 □Sgoul strength □Sgoul) □ Remote CPC cmd (A1) © CPC F8 (A2)	8
🔾 TOOLS 🤇	7051015	P2 (AI2)	Q (A0) Remote Flow cmd (A4) Remote flow (A4)	•
RECYCLE BIN	02001010	P1 [AI1]	A AG (A6)	•
·				
© 2024 Cla-Val v4.16.14 Privacy protection statement				
			rape 1 v av	ous per page: 5 💌 1-5 of 17 K K S 🗲 🕅



After configuring HTTPS Peering on Link2Valves, the next step is to set up the MD35 devices so they can communicate with each other.

To configure Peering on the MD35, follow these steps:

1. Access the Peering submenu from the Settings menu.



2. In the **Publication** section, configure the device that will publish its data. Enable publishing and select the publishing interval.

HTTP Server https://link2valves.com/api	•
Dubliching enabled	
Refresh time (min) *	
SAVE	

Reminder: A higher publishing frequency may lead to increased network data usage and battery consumption.



- 3. In the Subscription menu, configure the device that will receive the data.
 - a. Click the Refresh button to search for publishing devices, then click to enter the menu of the publisher from which the data will be collected.

Subscribing	Subscribing
Click on Refresh to populate the Table	Publishers Refresh Timeout Used
	D22-formation0 [356917050017081] 60 0 0
EST EST	ै TEST 💍 REFRESH

b. After selecting the publisher, choose the data refresh interval and set the timeout duration in case no data is available.

Subscriptions L	ist	
Local	Remote	
		add
Publisher Name D22-formation0		
Refresh Time (min) 60	Tin O	neout (min) *
		SAVE

c. Click "Add" and then click the button to add the channels you wish to subscribe to.

Remote Copy					
Source					
AI1		*			
Override local in	out				
		_			

By completing these steps, the MD35 devices will be able to communicate effectively via HTTPS Peering.



9.17 LOGGING SETTING

- 1. Click on "**Logging**" menu to access the corresponding configuration page.
- 2. Choose a recording interval. This interval manages the periodic recording of all activated inputs.
- 3. Click "SAVE" to apply the changes.

≡ MD35_2	231110011		
CLA-	2. VAL	Logging interval Interval (accords)* Interval (minutes)* 60 0 1 0 SAVE 3.	Export Choose the log files to export
A Home			O Log files for the last 30 days
۱/٥	~		EXPORT
NalvApp:	5™ ✔		
Events			
Settings	^		
Loggin	ng 1.		
ᅙ Conne	ctivity		
System System	n		
ப் Log off			
© 26/04/20	023 11:47:26		

9.18 PRIORITY ON OUTPUTS

The MD35 product provides multiple outputs, including the M-35, a digital output, and two solenoid outputs. These outputs can be controlled by various regulation blocs such as control curves 1 to 4, PID 1 to 4, actions, and ValvApps™. When two blocks are simultaneously controlling the same output, a priority list determines which one takes precedence over the other.

Here is the list of priorities, ranked from least to most prioritized:

- 1. Control Curve 1
- 2. Control Curve 2
- 3. Control Curve 3
- 4. Control Curve 4
- 5. PID 1
- 6. PID 2
- 7. PID 3
- 8. PID 4
- 9. Actions
- 10. ValvApps™



CLA-VAL MD35

9.19 BATTERY CONTROL

The battery display estimates the remaining time of the battery.

- 1. Ouring battery replacement.
- 2. Click on the "RESET BATTERY" button to reset the battery display.

This button resets the battery life statistics and should only be used after a battery has been replaced.

3. If you are not using a battery, you can disable the battery display by clicking on the "Use an external power supply" button.



9.20 FIRMWARE UPDATE

- 1. Click on to enter to the advanced mode.
- 2. Click on the " System" menu.

≡ MD35_231110011				🔹 · 🦻 🎽
MD35,231110011 Logical Call Logical Call Mone No ValvApps" Logical Call Events Settings	System Settings	Advanced Manually set date and time Detring the set of the set of time Detring the set of time Detring the set of time Set Case: And Table NEP Synchronization Detring the set of time Synchronize periodically with NTP server Exercise Exercise Synchronize periodically with NTP server Exercise Exercise Synchronize periodically with NTP server Exercise Exercise Exercise Exercise Synchronize periodically with NTP server Exercise Exercise	Battery information #827% (-3.575 days) Charge: 98 27 % Voltage: 2.78 V Charge: 2.18 A Temperature: 28 °C Days left:	1.
Settings ∧ Image: Logging Image: Connectivity <		Upload firmware Choose a file er 3. Enter a download address * Unchool maximum 4. Factory reset All configuration settings will be reverted to their factory rectory reset	O This button resets battery lifetime statistics and should only be used after a buttery is replaced.	



3. Click on the "Upload firmware - Choose a file" submenu, then choose ZIP file for example "MD35_2.3.2.tar".

🍅 Envoi du fichier				×		
\leftarrow \rightarrow \checkmark \uparrow \frown \land Ce PC \rightarrow Pro	✓ ^ひ					
Organiser 🔻 Nouveau dossier 📰 👔 😨 🛄 👔						
🛄 Bureau	Nom	Titre	Commentaires	Modifié le		
🔮 Documents	MD35_2.3.2.tar			15.05.2024 12:00		
📰 Images						
🁌 Musique						
🧊 Objets 3D						
🕂 Téléchargements						
Vidéos						
🏪 Disque local (C:)						
BE CVEU (D:)						
🛖 Finance (F:)						
🛖 Claval (G:)						
🛖 Logymec (L:)						
🛖 Autocad (M:)						
🛖 Ntcommon (N:)						
🛫 Production (P:)						
 Ouality (O·) 	× <			>		
Nom du fichier :	MD35_2.3.2.tar		✓ Tous les fichiers	~		
			Ouvrir 🛛	Annuler		

- 4. Click on the "**UPLOAD FIRMWARE**" button and wait a minute.
- 5. When the loading of the firmware is ok. Click on the "**REBOOT NOW**" button and wait a few minutes.



6. When the update is complete, the MD35 will return in "Configuration" mode and the LED will blink blue.

After some minutes of inactivity, the MD35 will exit "Configuration" mode and enter "Acquisition" mode.

Note:

On the CLA-VAL website (https://cla-val.ch). It is possible to download the latest version of the software & firmware.