



# CLA-VAL CV-Log-35

Communicating Data Logger

## User Manual



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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 CV-Log-35 has been installed by technicians instructed by CLA-VAL personnel and thereafter correctly maintained. During installation and maintenance, the inside of CV-Log-35 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 connector in hazardous locations. Always manipulate the battery connector in a safe location.



Using batteries other than those provided by CLA-VAL Europe risk danger of explosion, as well as implies the warranty on the product becoming void.

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 Europe reserves the right to modify or improve these products at any time without prior notice. CLA-VAL Europe 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 .

Help to preserve and protect the environment. Recycle used batteries and accessories; this means that according to local laws and regulations, they should be disposed of separately from household waste.

### 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) 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)
-  **Note**: Indicates useful information and advice
- : Indicates safety advice that must be strictly followed

### 1.6 ACRONYMS

**CSQ**: Cell Signal Quality

**LED**: Light Emitting Diode

**PIN**: Personal Identification Number

**NCR**: Notification Claim Return

**SMS**: Short Messages Service

**GPRS**: General Packet Radio Service

**USB OTG**: USB On-The-Go

### 2 CV-LOG-35 CHARACTERISTICS

- (1) Body with or without internal battery (according to version)
- (2) CV-Log-35 Head (main board + front panel)
- (3) Antenna

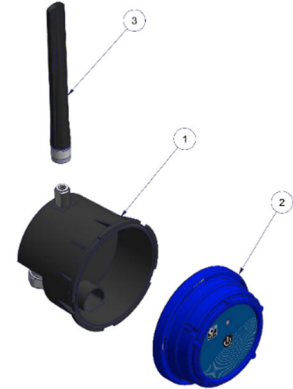


Figure 1 CV-Log-35 parts

- (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

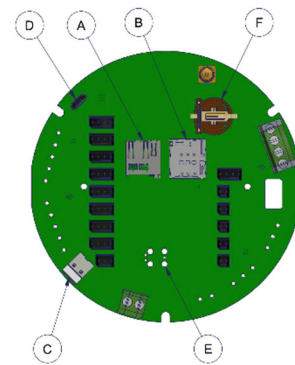


Figure 2 CV-log-35 interfaces

### 3 WIRING CHARACTERISTICS

Refer to the CVLog3500 wiring diagram for connection details.



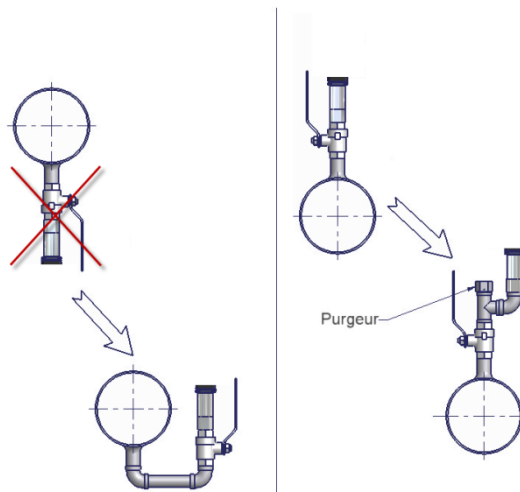
**Refer to the latest wiring diagram for the correct wiring!**

### 4 SENSOR MOUNTING

#### 4.1 PRESSURE SENSORS

The pressure sensors can be mounted either vertically or horizontally.

The pressure sensors are available in a choice of ranges. It is therefore important to choose the correct sensor range for the best precision.



#### 4.2 METER WITH PULSE EMITTER

Any pulse emitter may be connected to the CV-Log-35 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 CV-Log-35 instructions located in the CVLog3500 wiring diagram.



#### **Note:**

Always connect meter last to avoid arbitrary pulse counts.

In any case you can reset the counter from the user interface.

### 5 CV-LOG-35 MOUNTING



When mounting a CV-Log-35 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 reception quality on a potential installation site. For a more detailed analysis, use the CV-Log-35 configuration mode to get the exact reception quality. Refer to chapter 9.8 « Checking the quality of the network » for more details.

#### **Do not install: dBm < -95**

The CV-Log-35 configuration mode will indicate (amongst others) in dBm units, the network reception quality as seen by the CV-Log-35. Installation is not recommended below a value of -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 CV-Log-35 or deport its antenna with adequate CLA-VAL extension cables.

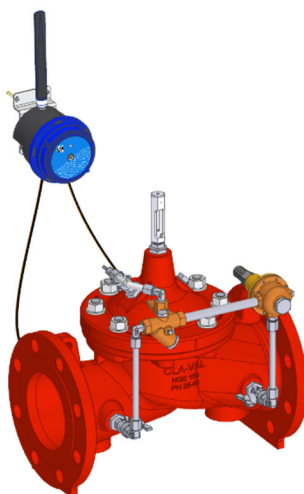
### 5.2 ORIENTATION IN SPACE

The CV-Log-35 should be mounted in an upright position (antenna side up, cable gland down) to guarantee a good cellular connectivity.

CV-Log-35 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.



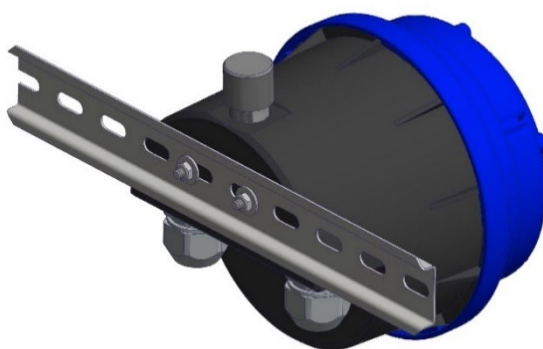
### 5.3 WALL MOUNTED INSTALLATION



CV-Log-35 can be fixed on walls using the wall mounted installation.

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

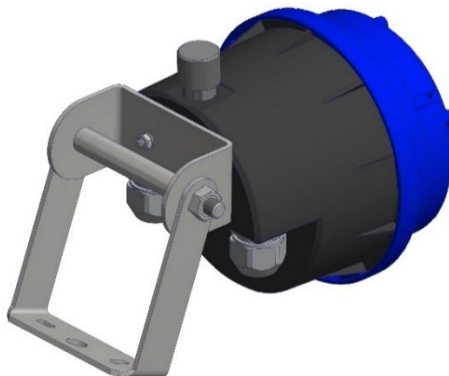
#### 5.3.1 DIN RACK MOUNTED INSTALLATION



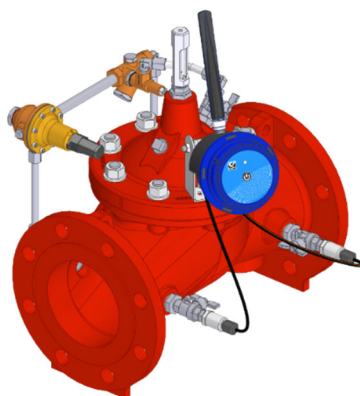
An alternative optional bracket is available for electrical box installation.



### 5.3.2 ORIENTABLE BRACKET MOUNTED INSTALLATION



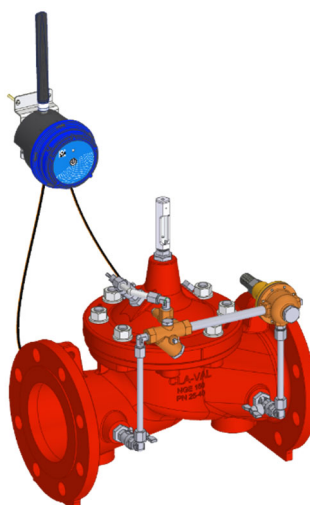
An alternative optional orientable wall-mounted or valve bracket for CV-Log-35.



### 5.3.3 RECOMMENDED INSTALLATION

Depending on the cellular network signal strength, the CV-Log-35 installation might need to be adapted. The network signal quality values mentioned below are indicative and correspond to a signal acquired with a High-Performance Cellular Signal and Network Analyzer, reference: Siretta® «SNYPER-LTE».

### 5.3.4 STANDARD INSTALLATION



The standard installation of the CV-Log-35 on the wall should be, as close as possible to the well opening, but not further than 1.5 m from the pressure sensor(s) connection(s) on the valve.

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



### 5.3.5 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 CV-Log-35 can be installed closer to the well opening, while maintaining a maximum distance of 1.5 m to the pressure sensors. If this is not possible, an antenna extension with optional CLA-VAL antenna extension cables might be necessary.

### 5.3.6 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.

## 6 CONNECTION



The cable glands are designed for cables between 4 mm and 6 mm diameter. Water intrusion may occur if sensors with cable diameters outside of this range are used.

### 6.1 PULSE COUNTING



#### **Note:**

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

The counter contact ("Normally Open" or "Normally Closed") must be connected between Tx/Cnt and GND (refer to CVLog3500 wiring diagram).

## 7 SIM CARD

### 7.1 PREPARING THE SIM CARD

A 3FF/Micro-SIM format SIM card is necessary for data communication compatible with LTE cat-M1, NB-IoT, or GPRS. CLA-VAL can optionally provide SIM card. If another SIM card than the one supplied by CLA-VAL is used refer to chapter 9.7 « Custom SIM Card » for configuration.

### 7.2 INSERTING THE SIM CARD

Insert the SIM card with the golden contacts downwards into the card holder. Refer to Figure 2 - Chapter 2 « CV-Log-35 Characteristics » and the symbol printed on the CV-Log-35 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.

## 8 STARTING OPERATION

If the CV-Log-35 model implements an internal battery, ensure it is connected to the battery connector on the electronic card (Figure 2 - Chapter 2 « CV-Log-35 Characteristics »).

### 8.1 CV-LOG-35 ASSEMBLY

**⚠** Before re-assembly, ensure the inside of the housings and seal are clean and dry. Presence of dust or humidity when installing may damage the product.

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

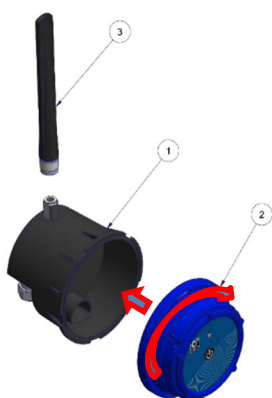
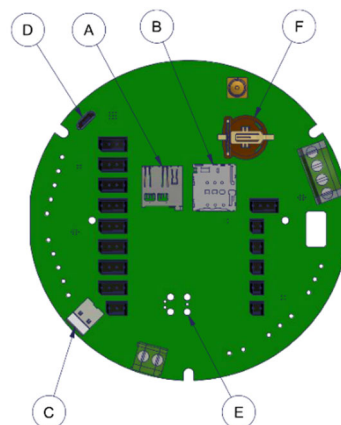


Figure 3 Body (1) and head (2) assembly



### 8.2 OPERATING MODE

The CV-Log-35 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 CV-Log-35. In this mode, the device acquires the signals from the connected sensors and inputs 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 CV-Log-35.

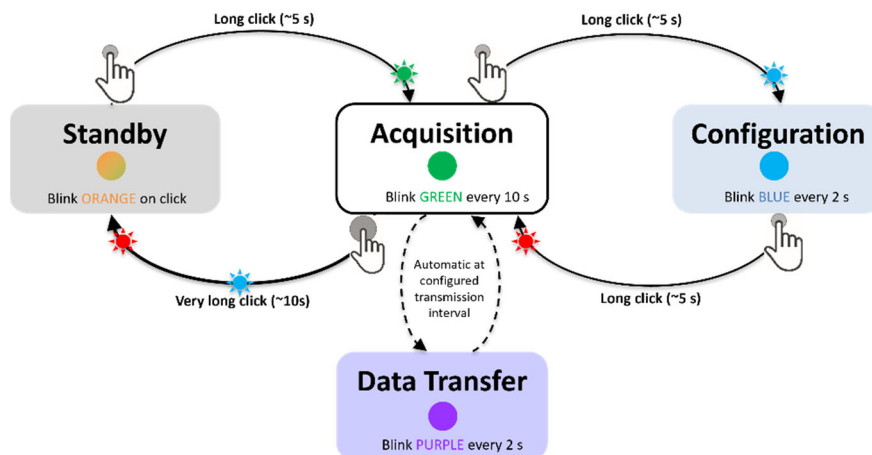


Figure 4 Logical diagram of switching from one mode of operation to another

### 8.3 INSTALLATION VALIDATION

The simplest and fastest way to verify the successful start of the product is to use the CV-Log-35 LED. The LED flashes green every 10 seconds when in "Acquisition" mode.

### 8.4 ACTIVATING CV-LOG-35

Once the following actions are performed

- ☐ 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 CV-Log-35 as indicated in Figure 4 (from "Standby" mode, press the button for 5 seconds)

## 9 TOOL & CONFIGURATION

### 9.1 INSTALLATION CHECKUP

The CV-Log-35 user interface in "Configuration" mode provides complete product parameters information such as sensor readings and cellular reception quality:

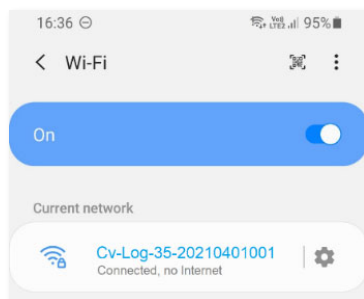
1. Activate "Configuration" mode on your CV-Log-35 as indicated in the previous section (from "Acquisition" mode, press the button for 5 seconds).
2. Connect your smartphone, tablet, or computer to the WiFi network generated by the CV-Log-35.

The network has the **default name**: *Cv-Log-35- < serial number >*

The default **password** is: *CVLOG35\_ < last 4 digits of the series serial number >*



**We strongly recommend to change the default password at first installation.**



**Note:** The network generated by the CV-Log-35 has no Internet access. Any error messages about this can be ignored without any problem.


3. Enter the address <http://d35.local/> or <http://192.168.4.1> in your usual internet browser, or scan the following QR code using a QR code reading application:

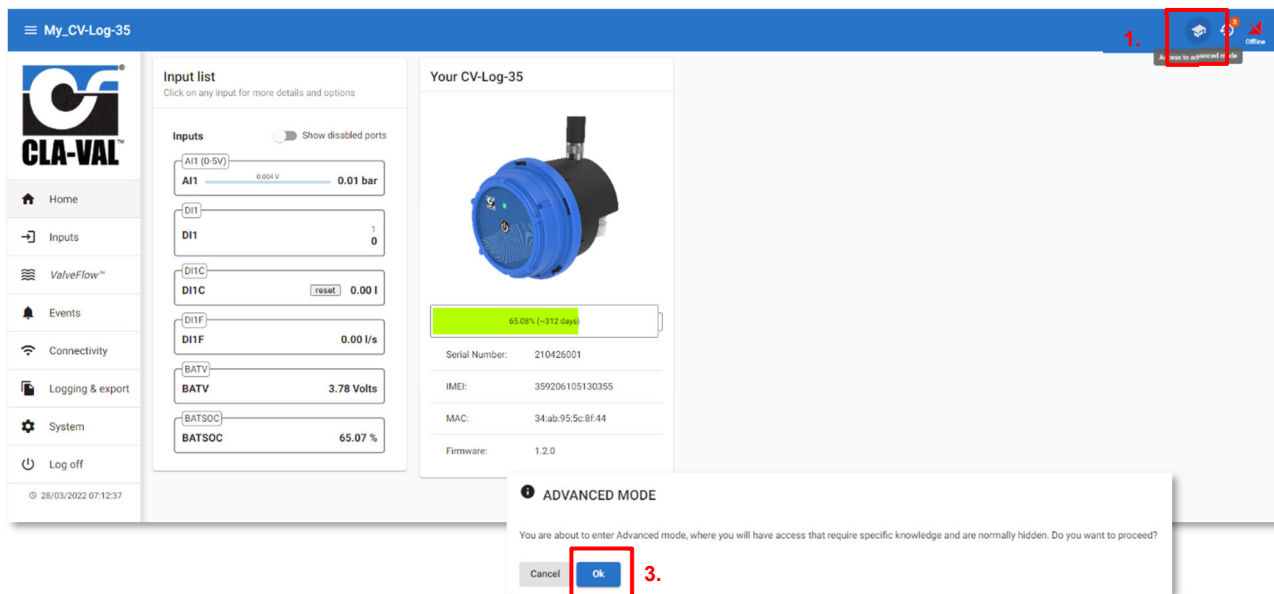



4. After a few seconds, the configuration interface of your CV-Log-35 will be displayed.
5. The home page allows to see the measured values in real time. It also contains the web browsing menu as well as other useful information of your CV-Log-35.

### 9.2 SIMPLIFIED / ADVANCED MODE

The advanced mode allows access to parameters requiring specific knowledge.

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



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, you will automatically exit the advanced mode.



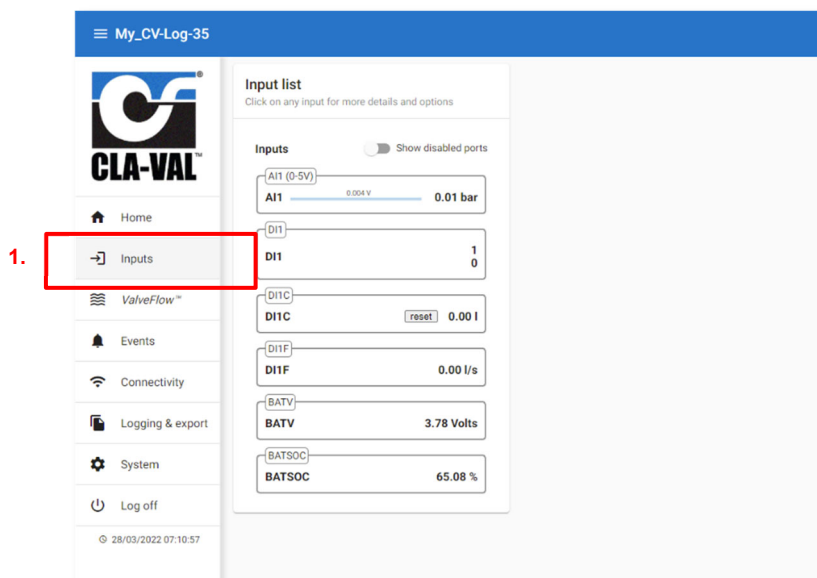
Some parameters require to switch to **"ADVANCED MODE"**. These settings are indicated by the following icon:



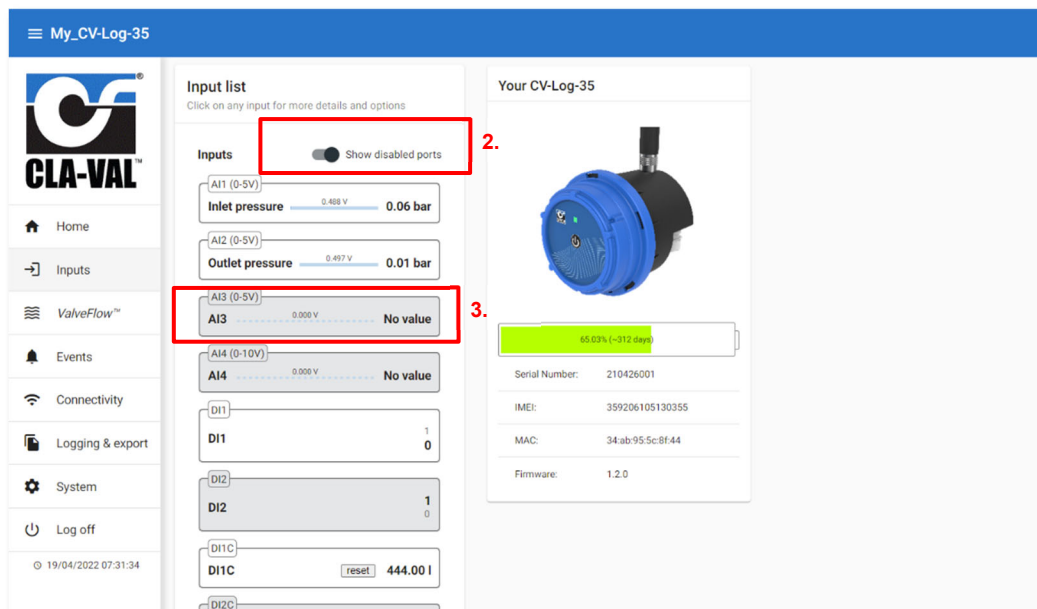
### 9.3 ANALOGUE INPUT SETTINGS

The inputs identified by **AI1**, **AI2**, **AI3** and **AI4** are analogue inputs.

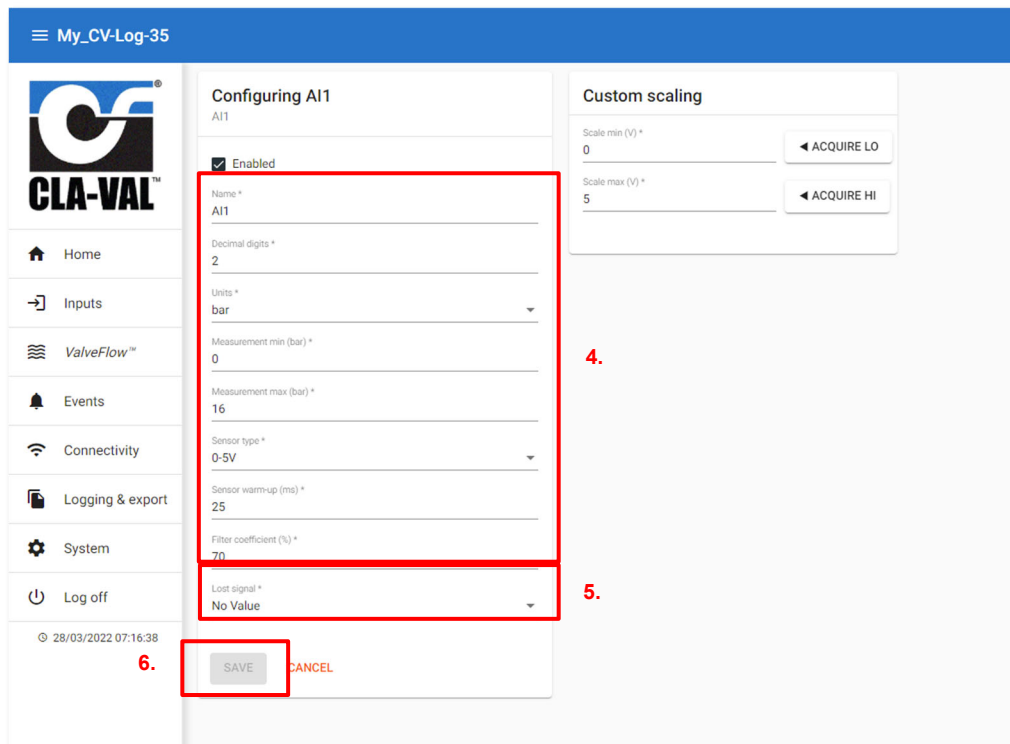
1. Click on "→ Inputs" to display the input configuration page.



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.



My\_CV-Log-35

**Configuring AI1**  
AI1

☒ Enabled

Name \*  
AI1

Decimal digits \*  
2

Units \*  
bar

Measurement min (bar) \*  
0

Measurement max (bar) \*  
16

Sensor type \*  
0-5V

Sensor warm-up (ms) \*  
25

Filter coefficient (%) \*  
70

Lost signal \*  
No Value

SAVE CANCEL


Custom scaling

Scale min (V) \*  
0

Scale max (V) \*  
5

ACQUIRE LO ACQUIRE HI

4. On the configuration page of the desired input, you can change the name and configure the sensor settings.

5.  , "Lost Signal" drop-down menu allows to configure 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:

- No Value
- A default Value
- The last Value

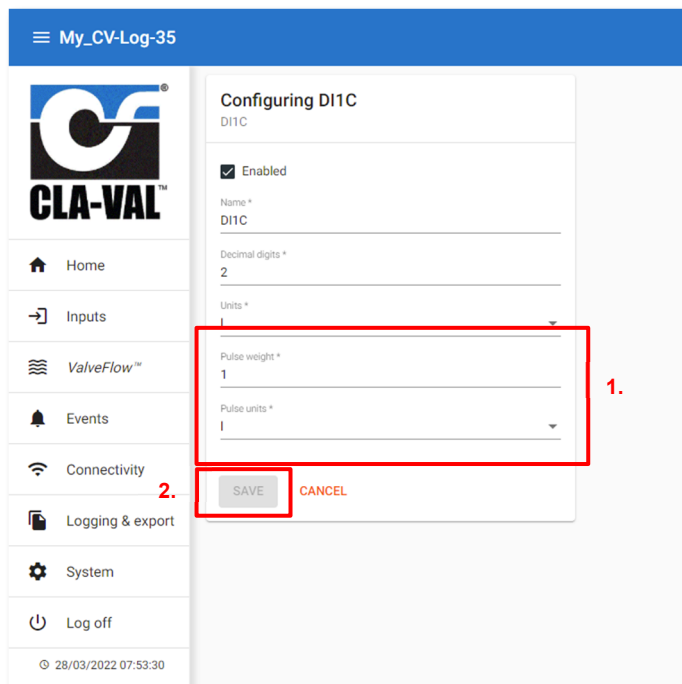
6. When done, click "**SAVE**" to apply your changes.

### 9.4 SETTING UP A FLOWMETER

Pulse meters must be connected to digital inputs (**DI1** or **DI2**). The configuration of these inputs **DI...** is broken down into two sub-inputs:

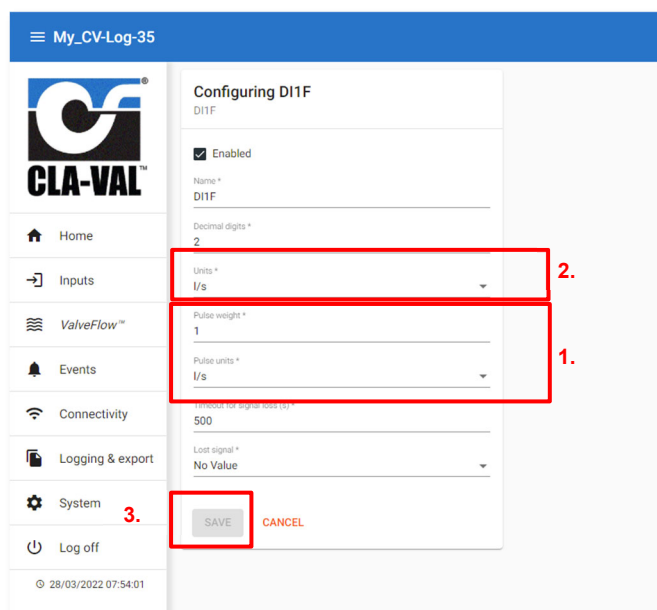
The input **DI...C** controls the display of the volume measurement.

1. Select the "pulse weight" for the flow meter and its units.
2. Click "SAVE" to apply the changes.



The input **DI...F** 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. Click "SAVE" to apply the changes.






### 9.5 EVENT SETTING

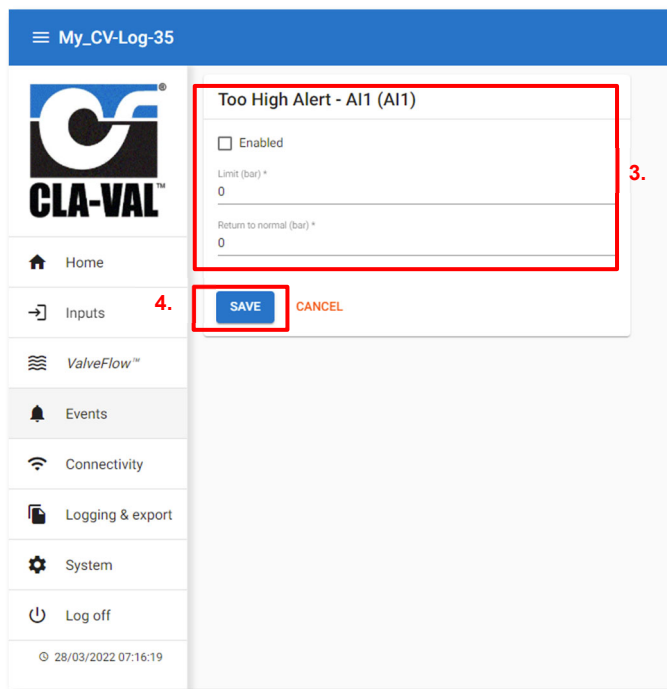
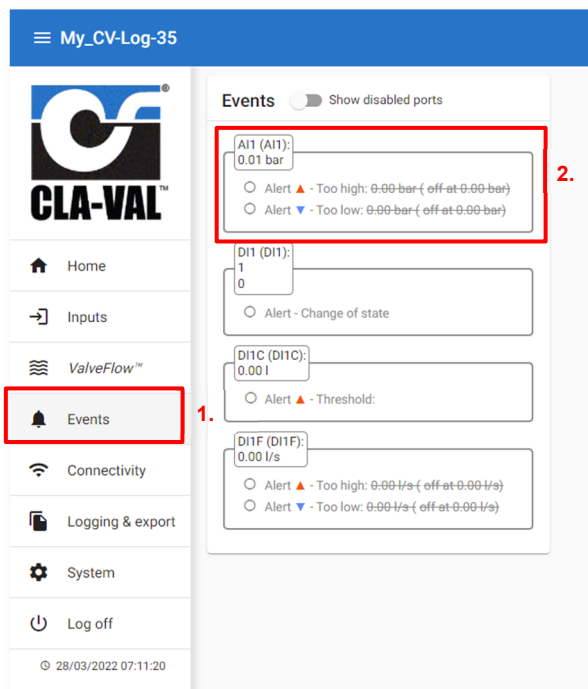
Events are used to set alarms.

You can set two types of alarms:

- The high alarm is used to detect values above a threshold.
- The low alarm is used to detect values below a threshold.

Alarms can be used to force data to be sent before the transmission period.

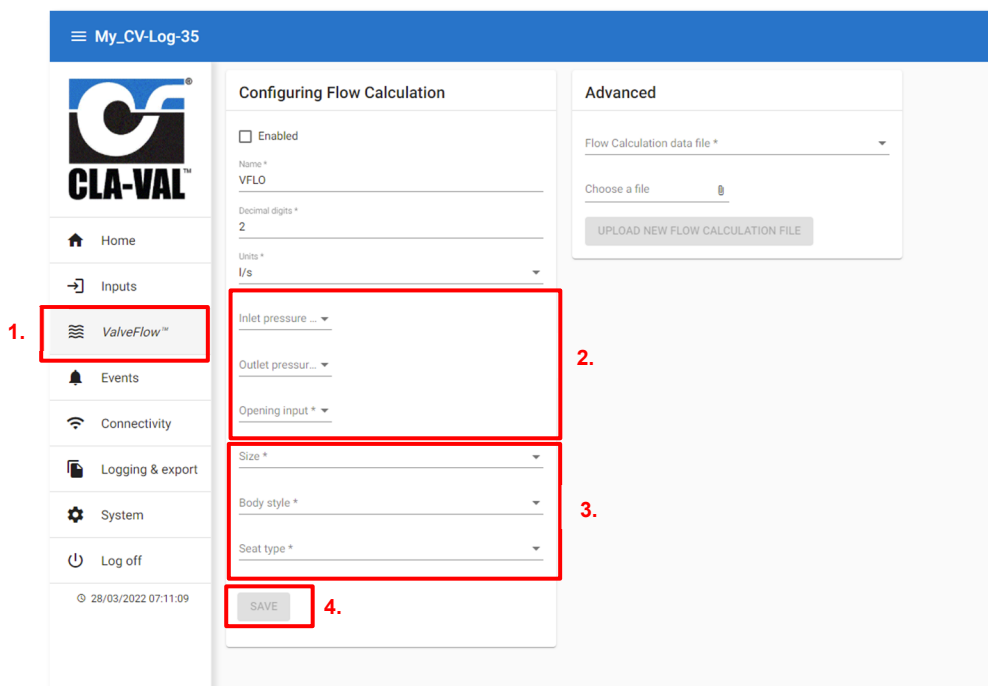
1. Click on "  **Events**"
2. Click on the input you want to configure.
3. Select the threshold and the return to normal value. The return to normal allows to define a dead band, to avoid oscillations between the active and inactive state.
4. Click **"SAVE"** to apply the changes.



### 9.6 VALVEFLOW™ SETTING (OPTION)

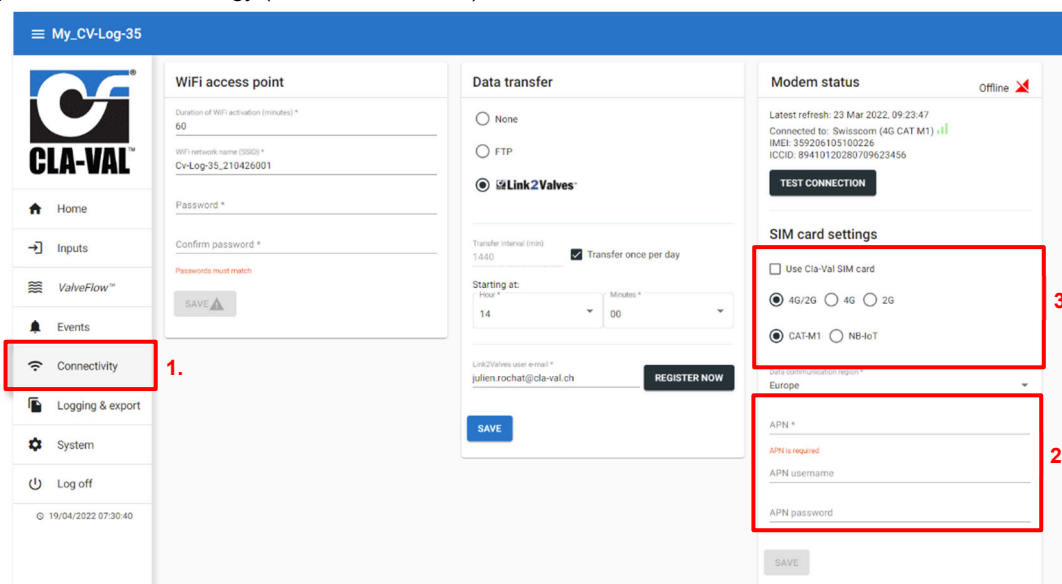
The ValveFlow™ allows calculating the flow through the valve, thanks to inlet pressure, outlet pressure, and valve opening.

1. Configure the ValveFlow by clicking on "ValveFlow™".
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.

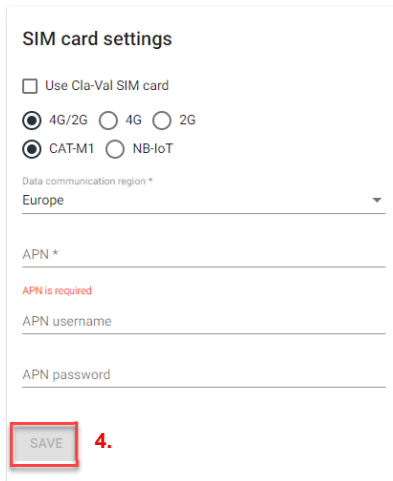


### 9.7 CUSTOM SIM CARD (COMMUNICATION OPTION)

1. Click on "Connectivity".
2. Enter the information corresponding to the APN of your SIM card (provided by your 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)



- 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-IoT

Data communication region \*

Europe

APN \*

APN is required

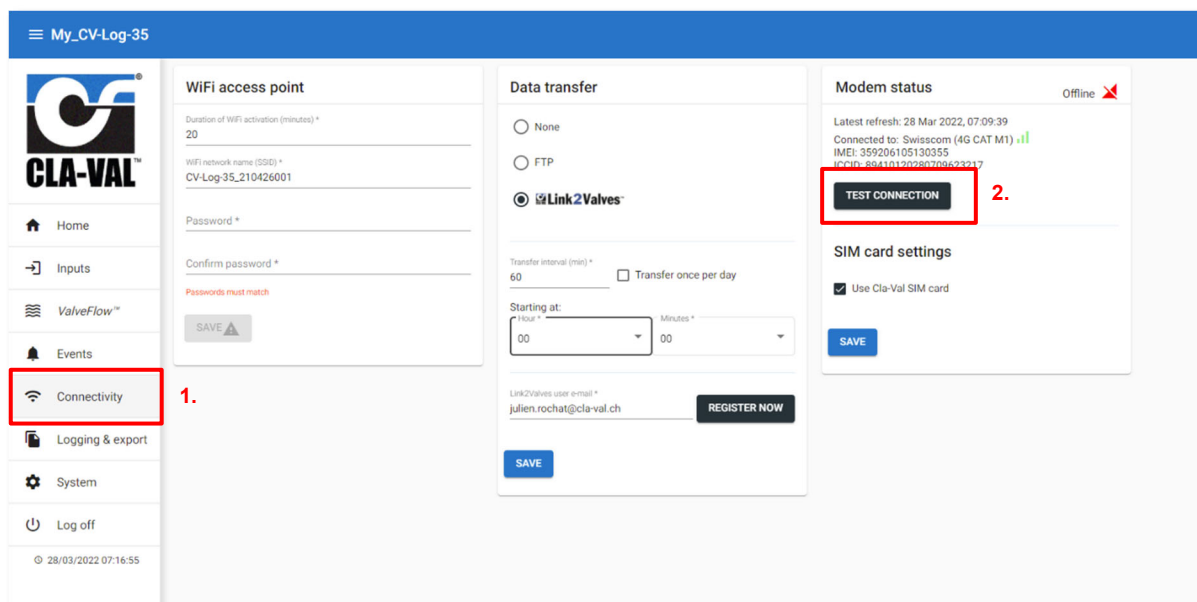
APN username

APN password

**SAVE** 4.

### 9.8 CHECKING THE QUALITY OF THE NETWORK (COMMUNICATION OPTION)

- Click on **"Connectivity"**.
- Click on the button **"TEST CONNECTION"**.



My\_CV-Log-35

**Connectivity** 1.

**WiFi access point**

Duration of WiFi activation (minutes) \*

20

WiFi network name (SSID) \*

CV-Log-35\_210426001

Password \*

Confirm password \*

Passwords must match

**SAVE**

**Data transfer**

☐ None

☐ FTP

☒ Link2Valves

Transfer interval (min) \*

60

☐ Transfer once per day

Starting at:

Hour \* 00 Minutes \* 00

Link2Valves user e-mail \*

julien.rochat@cla-val.ch

**REGISTER NOW**

**SAVE**

**Modem status** Offline

Latest refresh: 28 Mar 2022, 07:09:39

Connected to: Swisscom (4G CAT M1)

IMEI: 359206105130355

ICCID: 89410120280709623217

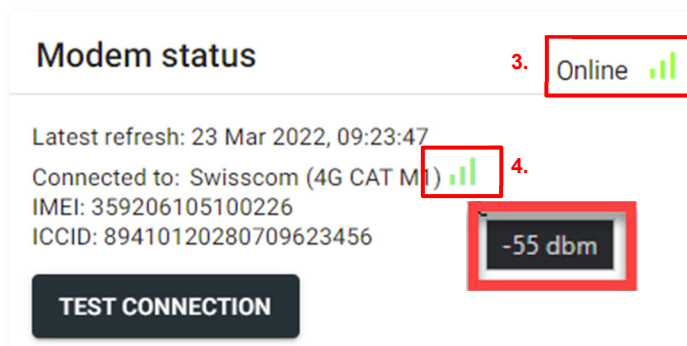
**TEST CONNECTION** 2.

**SIM card settings**

☒ Use Cla-Val SIM card

**SAVE**

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



**Modem status** 3. Online

Latest refresh: 23 Mar 2022, 09:23:47

Connected to: Swisscom (4G CAT M1) 4.

IMEI: 359206105100226

ICCID: 89410120280709623456

**TEST CONNECTION**

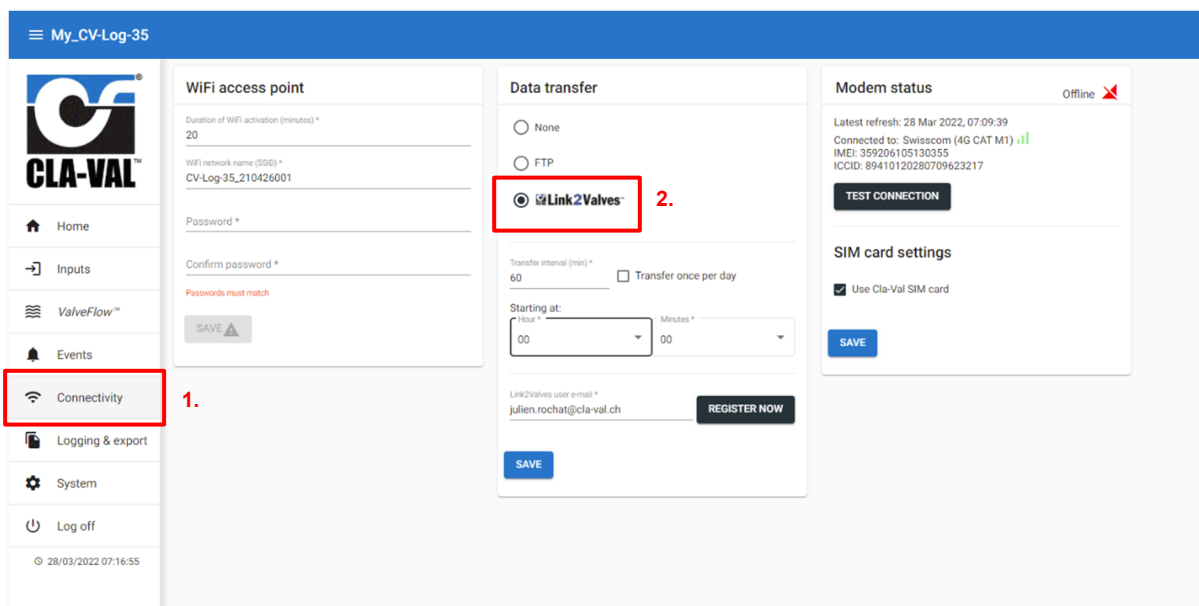
-55 dbm

### 9.9 REGISTER ON LINK2VALVES (COMMUNICATION OPTION)

Link2Valves™ is the CLA-VAL web platform (<https://cla-val.ch>) that allows the remote management of your CV-Log-35 as well as the visualization of its data history.

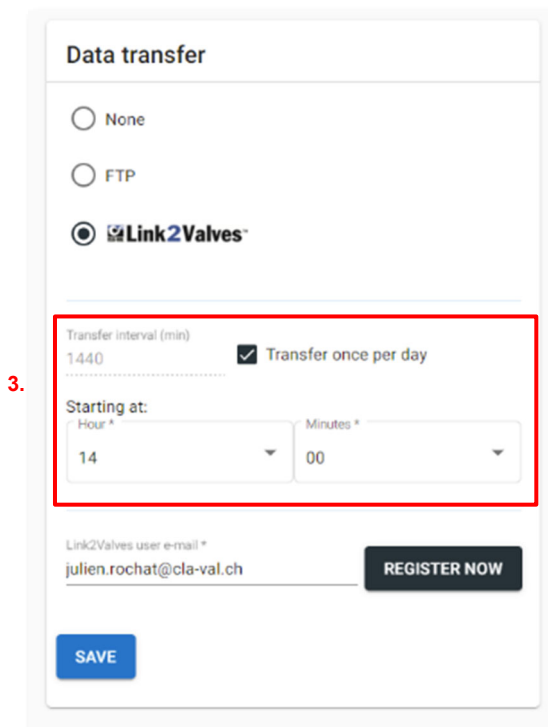
To use it, you need a Link2Valves account. Please contact CLA-VAL to get one for free.

1. Click on "Connectivity".
2. Under « Data Transfer », choose the "Link2Valves" option.



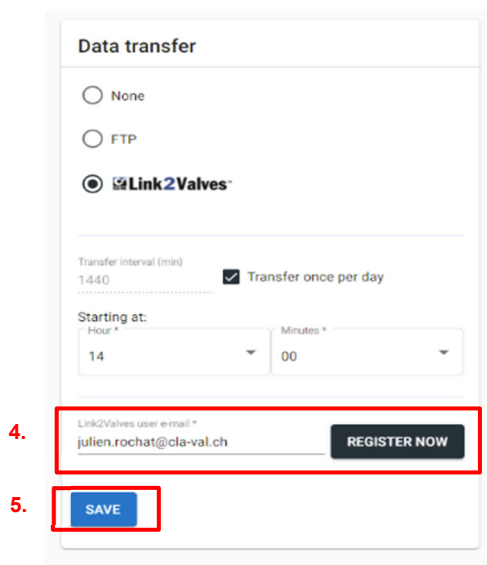
The screenshot shows the 'My\_CV-Log-35' web interface. On the left sidebar, the 'Connectivity' menu item is highlighted with a red box and labeled '1.'. The main content area shows the 'Data transfer' section with three radio button options: 'None', 'FTP', and 'Link2Valves'. The 'Link2Valves' option is selected and highlighted with a red box and labeled '2.'. Below this, there are fields for 'Transfer interval (min)' (set to 60), 'Starting at' (Hour: 00, Minutes: 00), and a 'Link2Valves user e-mail' field (julen.rochat@cla-val.ch) with a 'REGISTER NOW' button. There is also a 'SAVE' button at the bottom of the section.

3. Choose the transfer interval and the time from which the interval will start. This interval will determine the frequency of communications of the CV-Log-35 and Link2Valves. Please note that a faster interval will have a negative impact on the battery life of the unit, and generate potential additional costs.



This is a close-up of the 'Data transfer' form. It shows the 'Link2Valves' radio button selected. Below it, the 'Transfer interval (min)' is set to 1440, and the 'Transfer once per day' checkbox is checked. The 'Starting at' section shows 'Hour' set to 14 and 'Minutes' set to 00. A red box highlights the interval and starting time fields, with a red '3.' next to it. At the bottom, there is a 'Link2Valves user e-mail' field (julen.rochat@cla-val.ch) and a 'REGISTER NOW' button, along with a 'SAVE' button.

- Associate the CV-Log-35 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!"**.



**Data transfer**

☐ None  
☐ FTP  
☒ **Link2Valves**

Transfer interval (min): 1440 ☒ Transfer once per day

Starting at:  
 Hour: 14 Minutes: 00

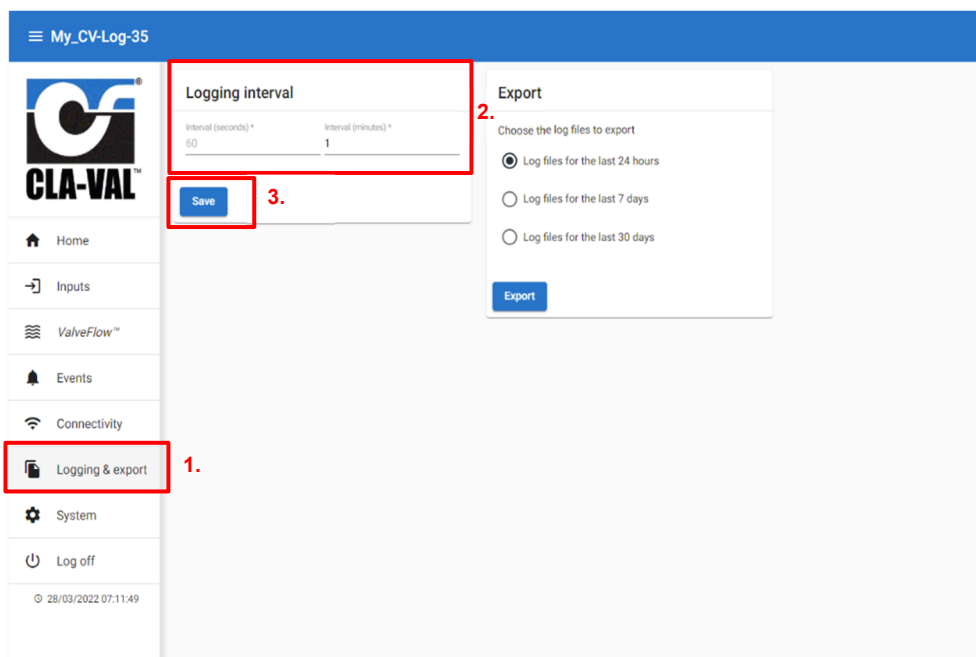
Link2Valves user e-mail:  **REGISTER NOW**

**SAVE**

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

### 9.10 LOGGING SETTING

- Click on **"Logging & export"** menu to access the corresponding configuration page.
- Choose a recording interval. This interval manages the periodic recording of all activated inputs.
- Click **"Save"** to apply the changes.



My\_CV-Log-35

**Logging interval**

Interval (seconds): 60 Interval (minutes): 1

**Save**

**Export**

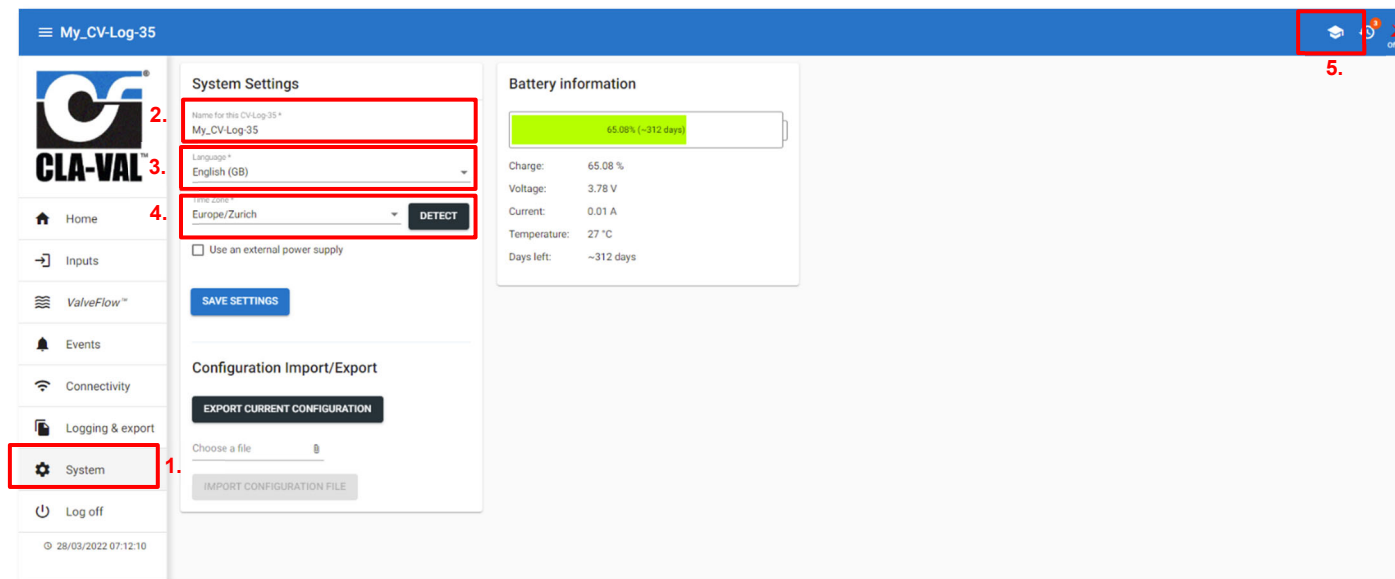
Choose the log files to export


☒ Log files for the last 24 hours  
☐ Log files for the last 7 days  
☐ Log files for the last 30 days

**Export**

### 9.11 BASIC SYSTEM SETTINGS

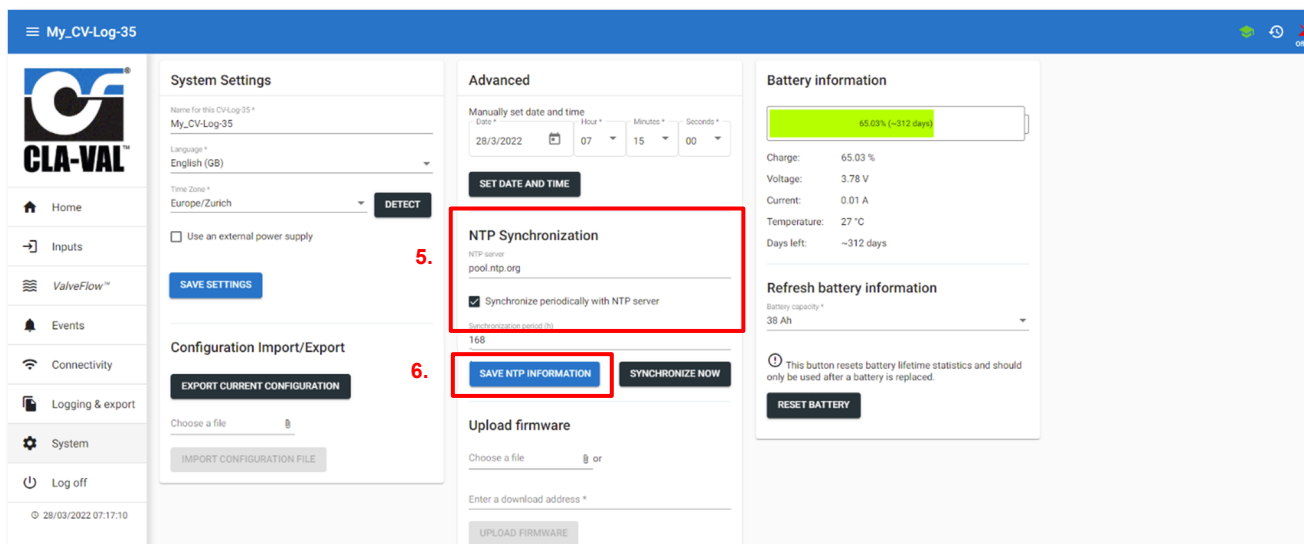
1. Click on the "System" menu.
2. Give your CV-Log-35 a name.
3. Select the language.
4. Select your time zone using the "DETECT" button. If the time zone is not detected correctly, you can choose it manually with the "Time Zone" drop-down menu.





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.

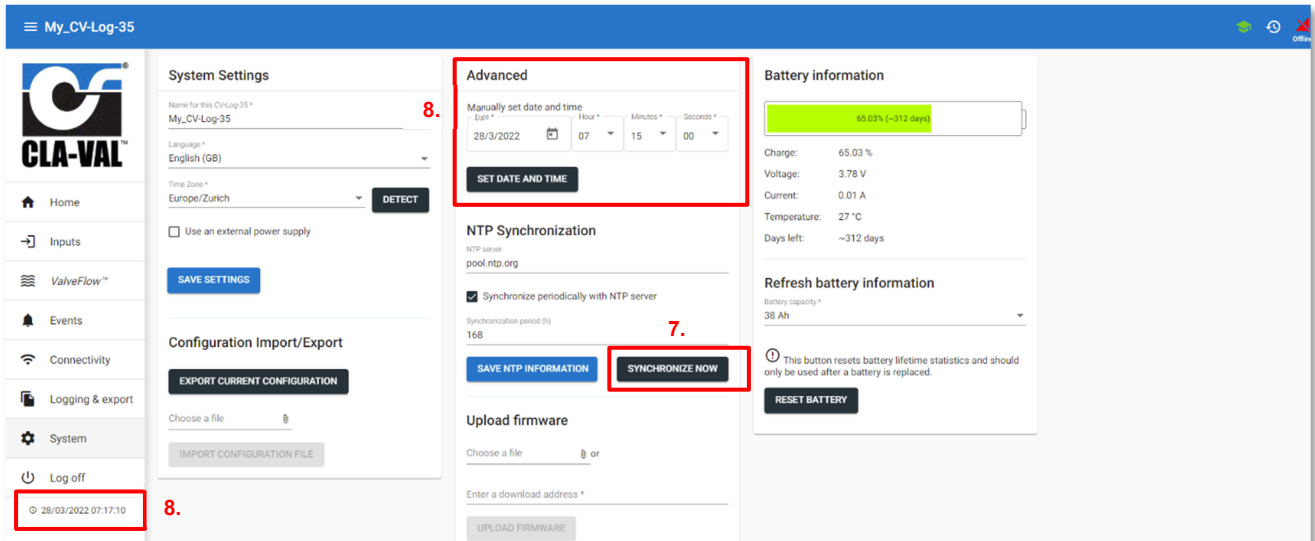
 This operation can only be performed if the CV-Log-35 is connected to the cellular network (option). If not, go directly to step 8.

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







7.  Click on **"SYNCHRONIZE NOW"** to update your unit's clock immediately.  
 This operation can only be performed if the CV-Log-35 is connected to the cellular network (option). If not, go directly to step 8.
8. Check that the time displayed on the clock below the navigation menu is correct. If not, you can set the time manually in **"Manually set date and time"**. Click on **"SET DATE AND TIME"** to have the change applied.

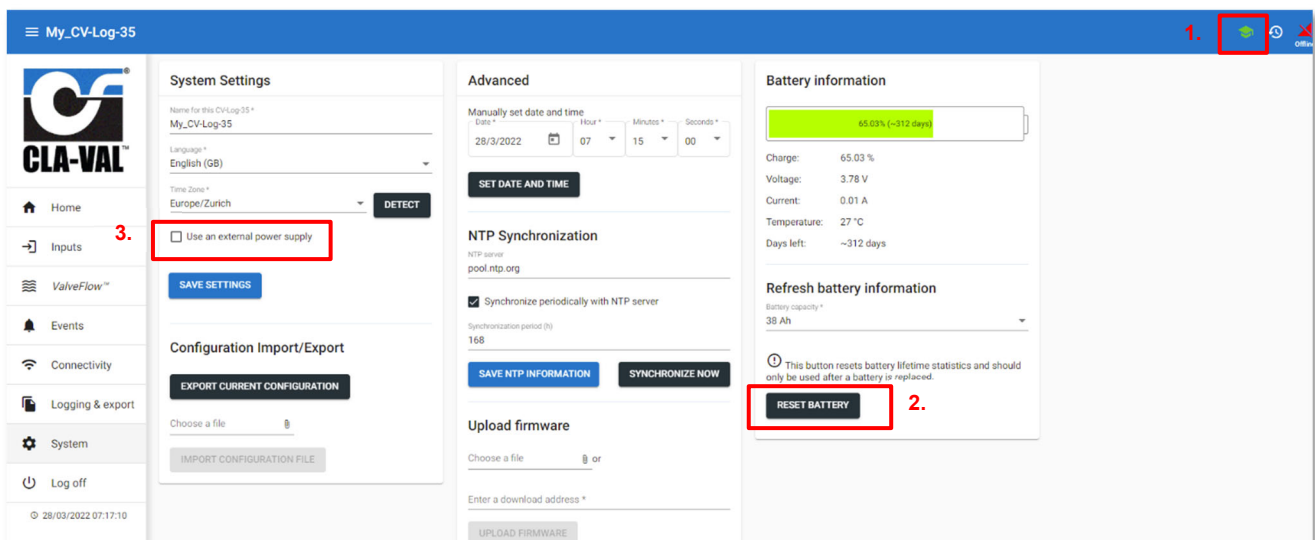


The screenshot shows the My\_CV-Log-35 web interface. On the left is a navigation menu with options: Home, Inputs, ValveFlow™, Events, Connectivity, Logging & export, System, and Log off. The main content area is divided into three panels. The left panel is 'System Settings' with fields for Name, Language, Time Zone, and a 'DETECT' button. The middle panel is 'Advanced' with a 'Manually set date and time' section (Date, Hour, Minutes, Seconds) and a 'SET DATE AND TIME' button. Below this is 'NTP Synchronization' with a 'SYNCHRONIZE NOW' button. The right panel is 'Battery information' showing a battery level bar at 65.03% and a 'RESET BATTERY' button. Red boxes and numbers highlight specific elements: '8.' points to the 'Log off' button and the current time '28/03/2022 07:17:10'; '7.' points to the 'SYNCHRONIZE NOW' button.

### 9.12 BATTERY CONTROL

The battery display allows to estimate the remaining life of the product.



1.  During 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.

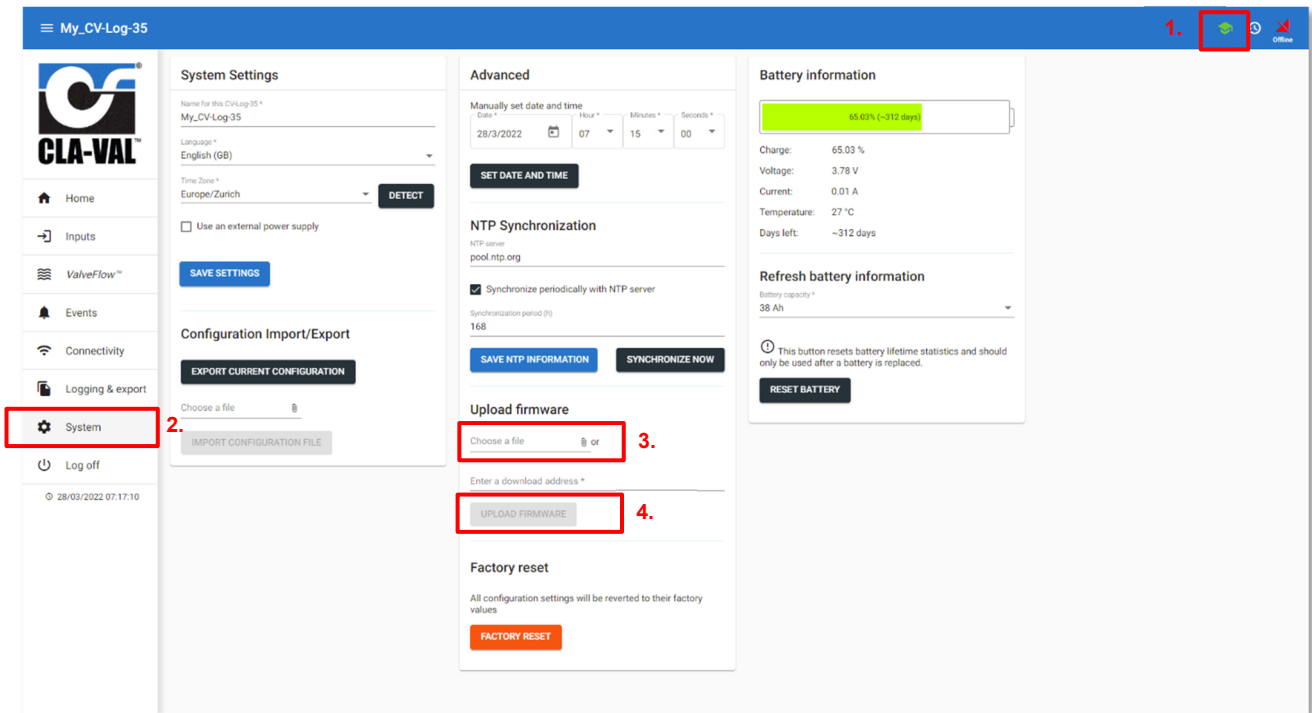


This screenshot shows the same web interface as the previous one, but with different highlights. Red boxes and numbers highlight: '1.' points to the status bar in the top right corner; '3.' points to the 'Use an external power supply' checkbox in the System Settings panel; and '2.' points to the 'RESET BATTERY' button in the Battery information panel.

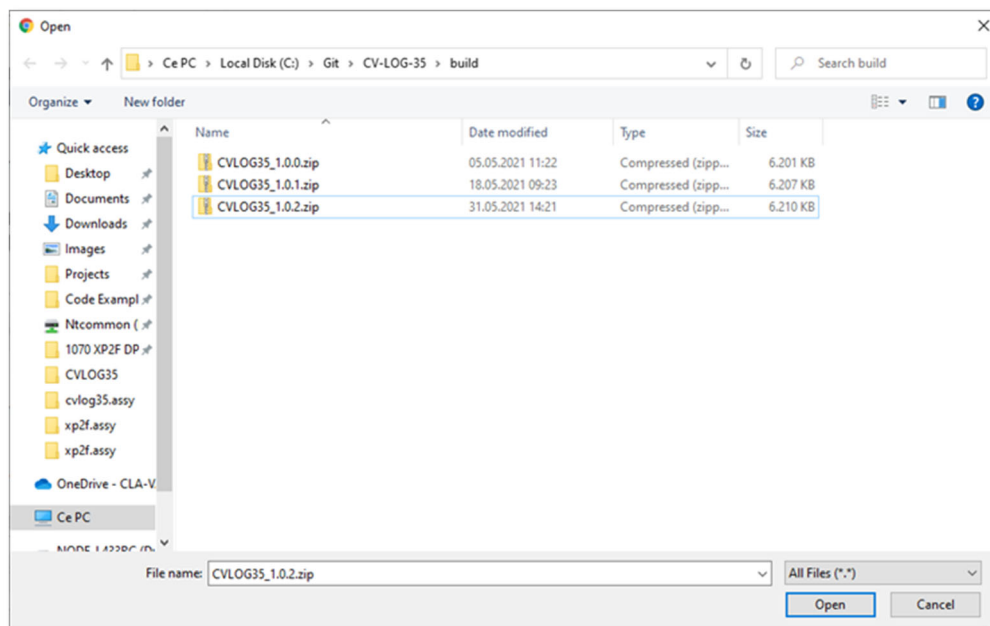


### 9.13 FIRMWARE UPDATE


1. This chapter must be in advanced mode, click on .
2. Click on the " System" menu.



3. In the «Upload firmware» submenu, locate and select the distribution ZIP file for example "CVLOG35\_1.0.2.zip".



4. Click on the "**UPLOAD FIRMWARE**" button and wait a few minutes.
5. Completely power off the CV-Log-35 to apply the update. To do so, press the product button for 5 seconds to turn off the WiFi.

6. Make sure the LED flashes green every 10 seconds, indicating that the product is in "Acquisition" mode Then press the main button for 10 seconds to completely switch off the CV-Log-35 (a red flash appears after 10 seconds)
7. Once this step is complete you can restart the device and go back to configuration mode.  during the restart the CV-Log-35 will flash purple for a few minutes. Do not disconnect the power during this time!



**Note:**

Before upgrading firmware on a CV-Log-35, please check on the CLA-VAL website (<https://cla-val.ch>) for the latest version of the software & firmware.

## 10 SUPPORT

### 10.1 MAINTENANCE AND RETROFIT

The CV-Log-35 is maintenance-free over the entire battery lifetime, which depends on the measurement and transmission frequencies settings (which are remotely configurable). However, environmental conditions may shorten battery lifetime and the presence of humidity inside the housing lead to corrosion. Prevent these situations with clean and robust installations.

When the battery reaches its end-of-life, ask CLA-VAL, or an authorized reseller for maintenance assistance to change the battery, update the device to the most current Firmware, and test the system.



### 10.2 NON-CONFORMITY RETURN (NCR)

Only return CV-Log-35 under warranty after attribution of an Equipment Return Authorization provided by CLA-VAL Europe. The returned CV-Log-35 must be clearly marked with the Non-Conformity (NCR) number.

## 11 ACCESSORIES



Warning: Warranty may be void if accessories other than those recommended by CLA-VAL Europe are used.

Parts	Order Code	Description
	MEXE-B11-02	Internal battery replacement
	MEXE-B11-01	External High-Capacity battery replacement