Smart Flow iLink V4.1

Mono & Twin version

User Manual

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1. General safety warnings

- Keep the device out of the reach of children.
- Do not expose the device to temperatures below -25°C or above 80°C.
- Do not expose the flow sensor to liquids below 0°C or above 65°C.
- Do not expose the flow sensor to pressure above 17.5 bar (1.75 MPa).
- During installation, cleaning or decontamination of the sensor, the iLink should be disconnected from the sensor and protected from water or other fluid.
- Basic knowledge of plumbing is required to install the sensor on water points.
- The sensor is designed to work with drinking water. Using other fluids may damage the sensor.
- Droople cannot be held responsible if the product or its components are used or manipulated differently than specified in the User Manual or in the Quick Installation Guide.

2. Standard naming conventions

iLink : LoRa communication module enabling data to be transmitted from the sensor to the Droople App via the gateway.

MiniHub gateway : LoRa to WiFi gateway enabling data to be uploaded in the cloud.

Sensor : water sensor that measures the temperature and the flow of water.

Device : refers to the combination of the iLink and the sensor.

Droople App : Cloud platform used to receive and display data from the device.

Asset: Anything that processes or consumes water such as: filter, softener, shower, urinal, etc.

Consumable: Anything connected to an asset whose lifetime depends on the flow quantity that was consumed or processed (e.g. the salt for a softener, or a filter cartridge).

Cycle: A new cycle is counted when we detect a new flow activity after a period where nothing happens during at least 2 seconds. That is, there must be 2 seconds of “pause” between two consecutive cycles to count two different cycles. The cycle count is incremented at the beginning of the cycle.

By default, a cycle starts when we have more than 20 steps/seconds and a new cycle is counted after a “pause” of 2 seconds. This means that only cycles with a flow rate higher than 2.4 liters/min with the standard saier sensor are measured.

3. How to use the Droople App

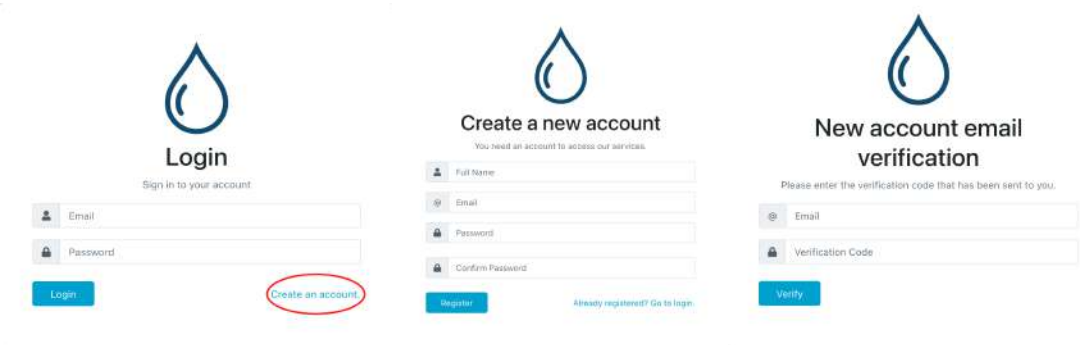
A. Accessing the App

To access the app on your desktop computer or smartphone, open your internet browser and go to https://app.droople.com.

You are then prompted to log in or to create an account if you do not already have one.

How to create an account ?

To create an account click on Create an account. Then enter your basic contact details and set up your password. Finally, verify your account using the code sent to your email address.



After logging in, you will be redirected to your asset's Dashboard.

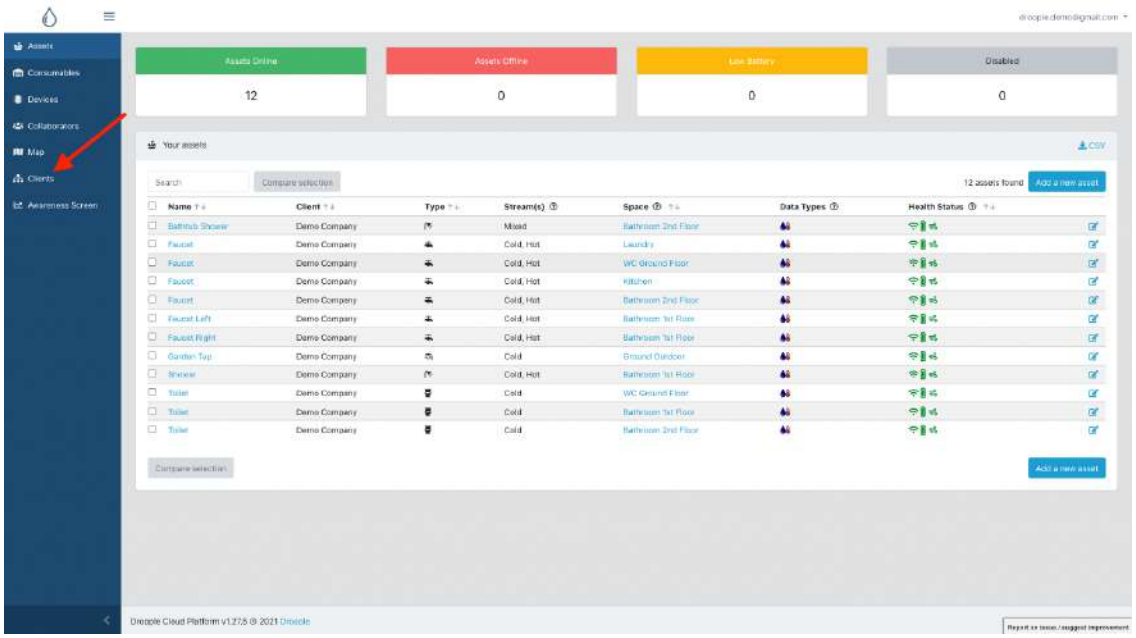
B. Client Management

The platform gives you the ability to create different levels of ownership if you have multiple clients that need to have access to some assets that belong to them but which are also under your management.

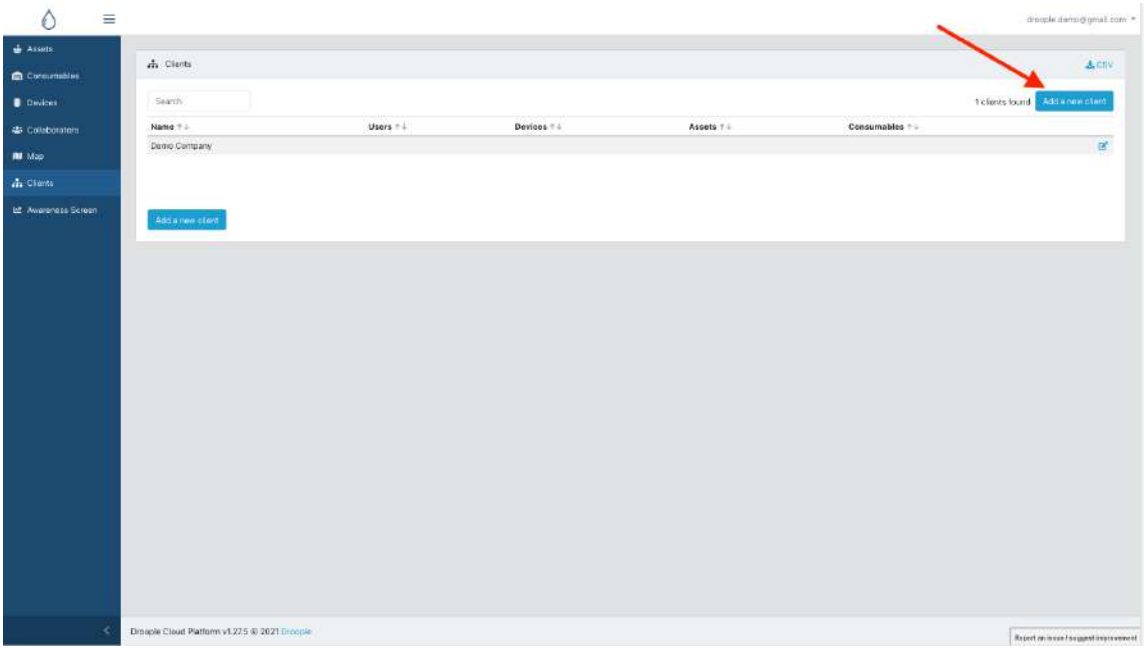
For example, you are managing three coffee machines that are installed at three different clients and these clients also need access to their coffee machine, then it is possible to create "child" clients (your clients) under one "parent" account (your account).

How to do that?

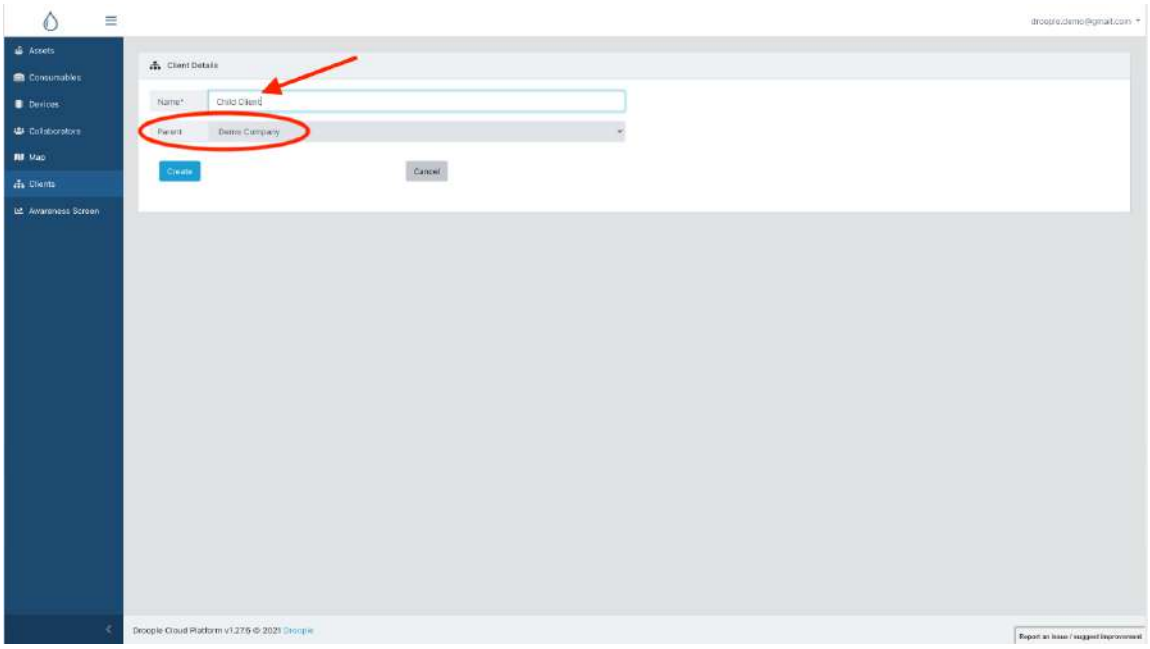
First, you need to log in to your account. Then, once on the landing page, click on the "Client" tab on the left of your screen.



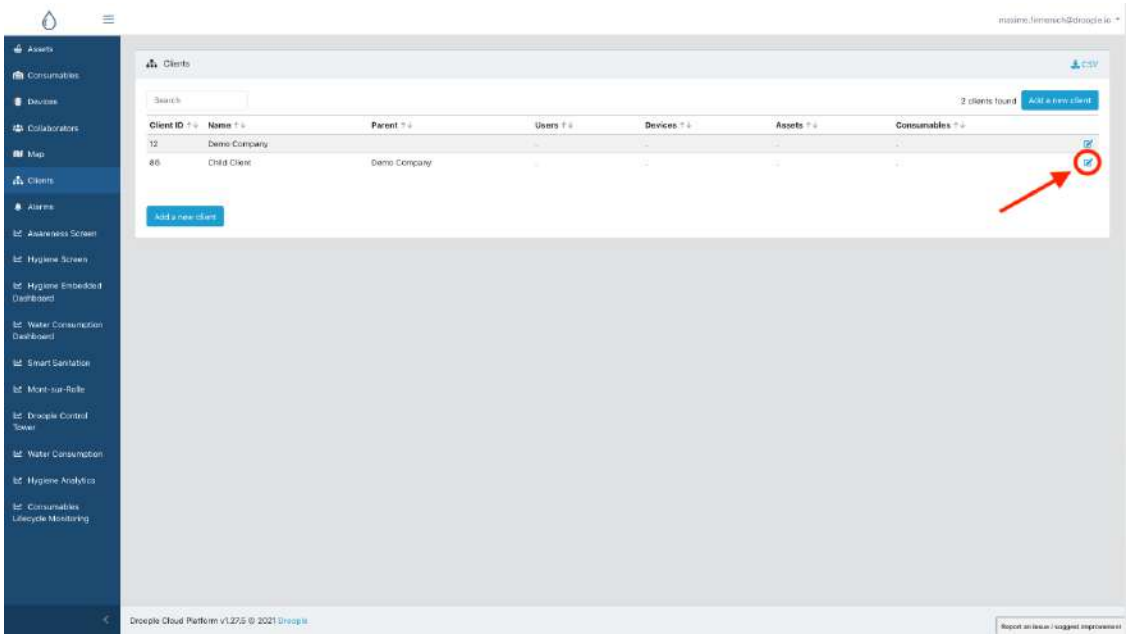
Once you are on the “client” page, click on the “Add a new client” button situated on the right side of your screen.



Then, just fill in the name of the client you want to add, it will be automatically linked as a “child” client under your “parent” account.

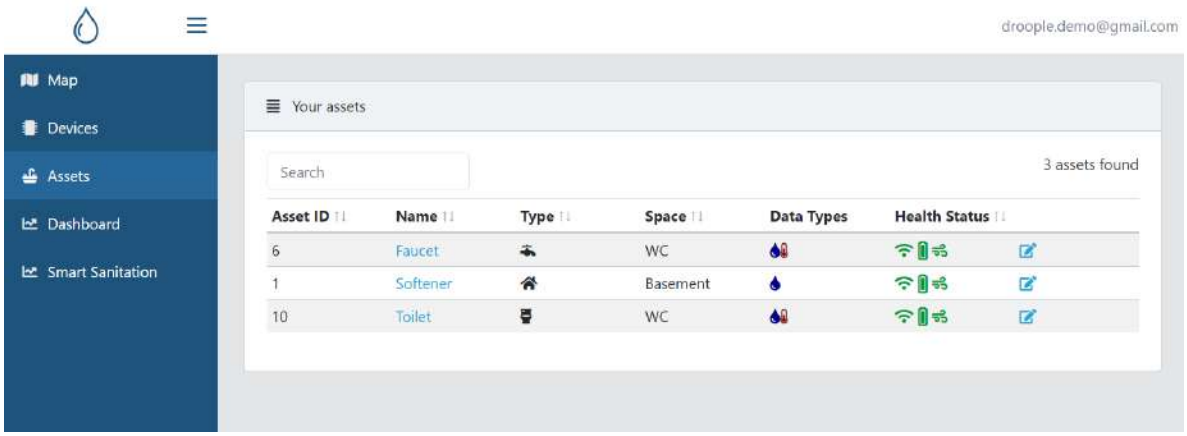


That's all! If you go back to the “client” page by clicking on tab on the left side, you will see your newly created client and you can always manage these child clients by clicking on little icon on the right.



C. Visualizing your assets data

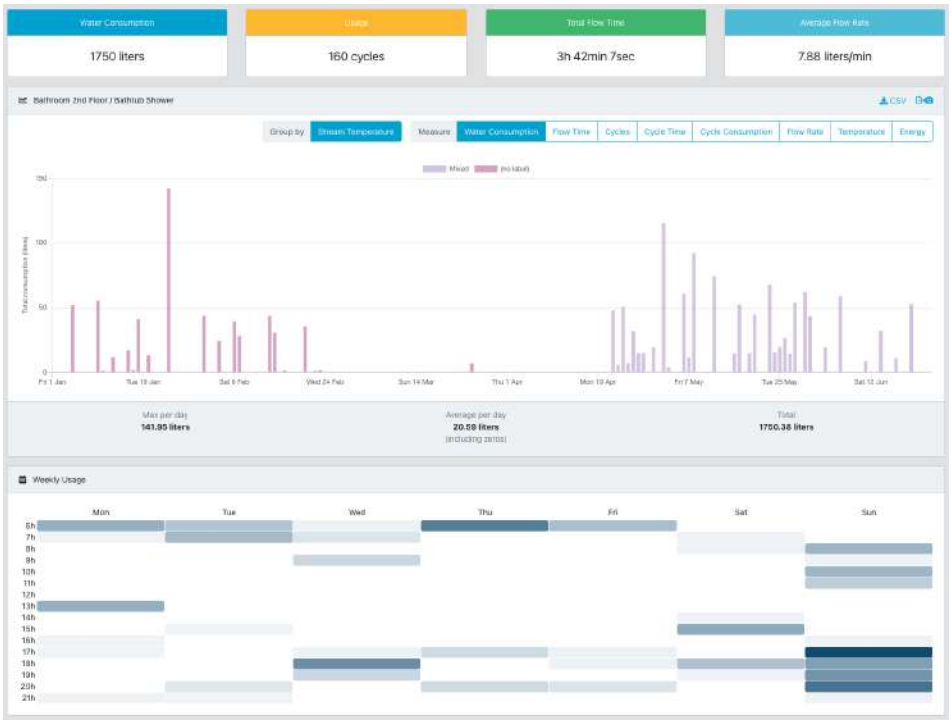
To visualize your assets data, you can either click on *Dashboard* which will display the first asset you have configured, or go to the *Assets* tab on the menu and click on the asset name you want to display.



On the Dashboard, you can see:

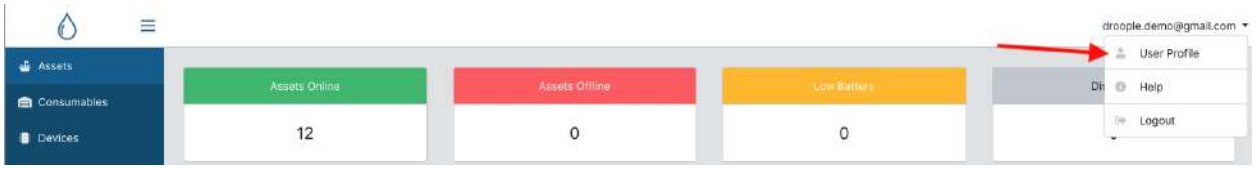
1) The **name** of the asset shown
2) A **view** selection toolbar, which let you choose between:
    a) Last 24 hours, grouped by hour
    b) Last 7 days, grouped by days
    c) Last 30 days, grouped by days
    d) Last 12 months, grouped by months
    e) A custom observation period and precision. If you select this option, you will need to enter your custom parameters in the top menu bar.
3) A Key Performance Indicator list on top of the page with
    a) The total **flow quantity** (volume of water) that was measured through all the sensors connected to the asset during the currently observed period.
    b) The last recorded **temperature** that was measured through all the sensors connected to the asset during the currently observed period. If several temperature sensors are connected to the asset, the average value is displayed.
    c) The total **flow time**, which is the amount of time during which the water has been flowing through all the sensors connected to the asset during the currently observed period. If several flow sensors are connected to the asset, the sum is displayed.
    d) The average **flow rate** over the observed period. This corresponds to the measured flow quantity over the flow time.
    e) (For Mono version only) The total amount of **cycles** counted during the observed period.
4) **Historical data** plots displaying the above-mentioned metrics over time.

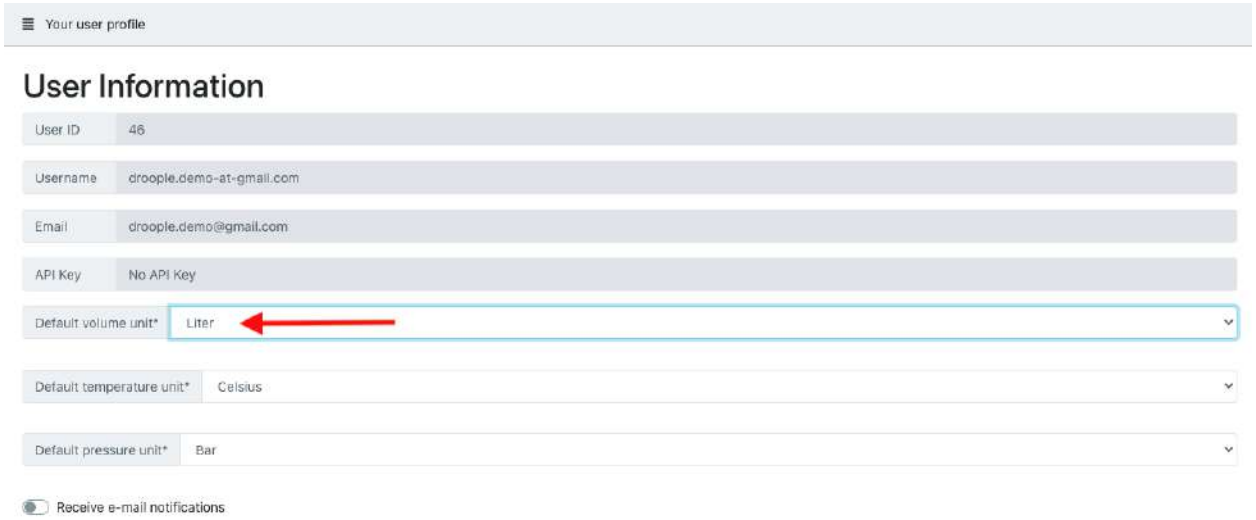
If several sensors are connected to the asset, the charts distinguish the different streams observed.



C. Changing the unit system to US Customary Units (US gallons and °F)

To change the unit system from SI Units (liters and °C) to US Customary Units click on your e-mail address on the top right corner of the screen and then select the default volume.

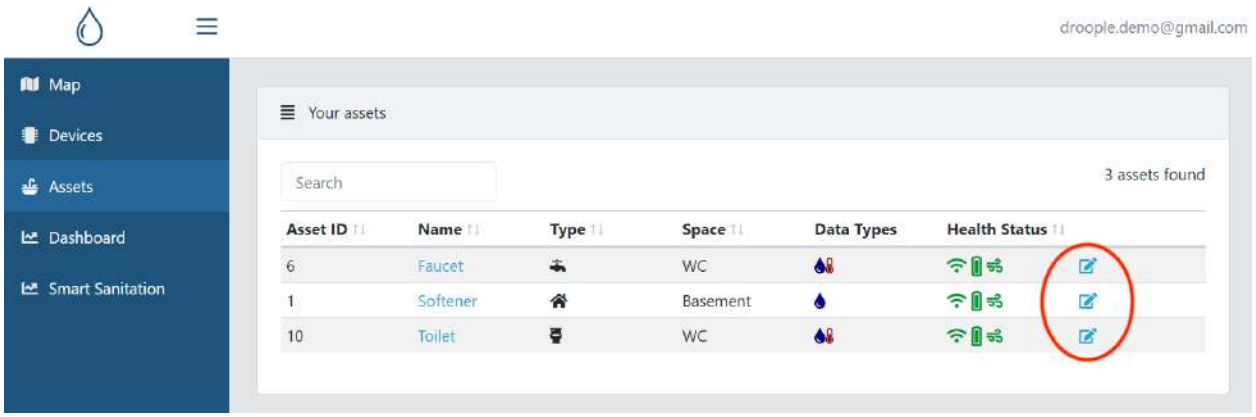




D. Configuring your asset

To configure a **new** asset, please refer to the Quick Start Guide.

To **edit** an existing asset, go to the *Assets* tab and click on the edit icon



1) To **detach** (remove) a device previously connected to an asset, click on the delete icon next to the iLink name in the asset edition view
2) To **attach** a new device to the asset, click on "Add another device" and select a device from the list. Note that the list only displays devices that have already been registered with your account and that are currently not attached to any other asset.

Your asset details

Asset ID	73
Name*	Bathtub Shower
Asset Type*	Shower
Address	ZI du Verney 4, 1070 Puidoux, Schweiz

Space	Bathroom 2nd Floor
Timezone*	Europe/Zurich

iLink 5B:37:6B:13 (1)

Number of sensors*	1
Sensor Type*	Flow & Temp. (1/2" - HHL)
Stream Temperature	

+ Add another device (2)

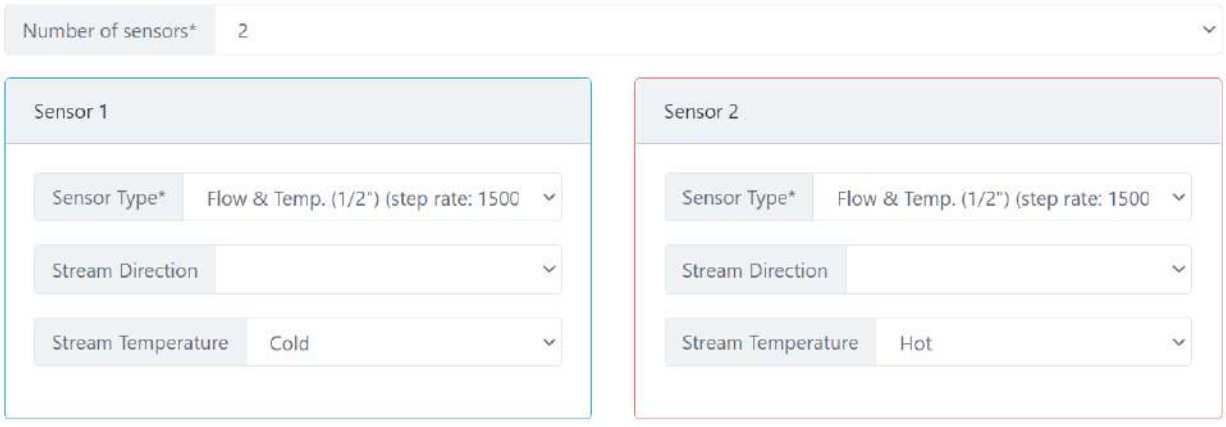
Update Cancel

E. Monitoring two different streams of water connected to the same asset

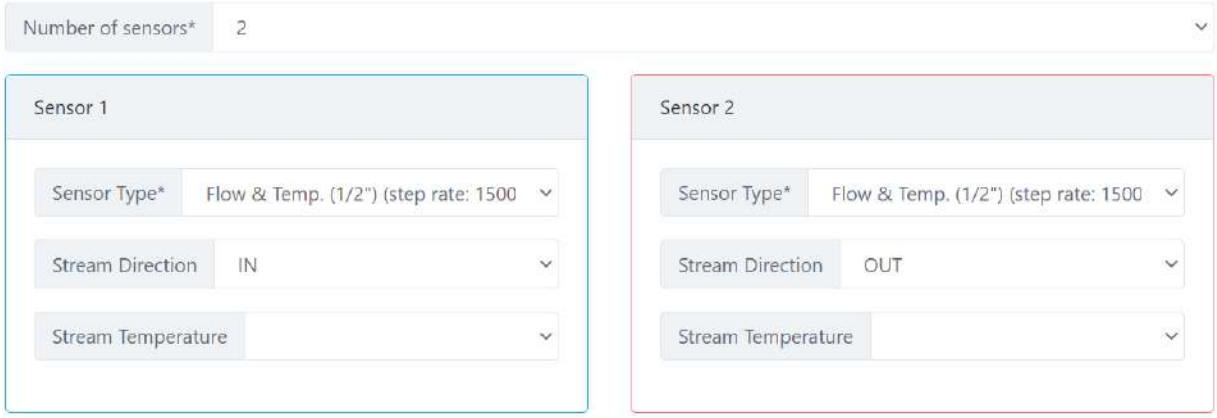
To monitor two different streams of water connected to the same asset, you need an **iLink Twin with two sensors** connected to each water stream of the asset.

Then, on the **asset configuration page**, you can specify which sensor is measuring which water stream.

Make sure to write down which sensor (labeled "1" or "2") has been plugged into each pipe. We recommend always plugging sensor 1 to Cold and sensor 2 to Hot (as they are colored accordingly). This helps to prevent mistakes when configuring your asset.



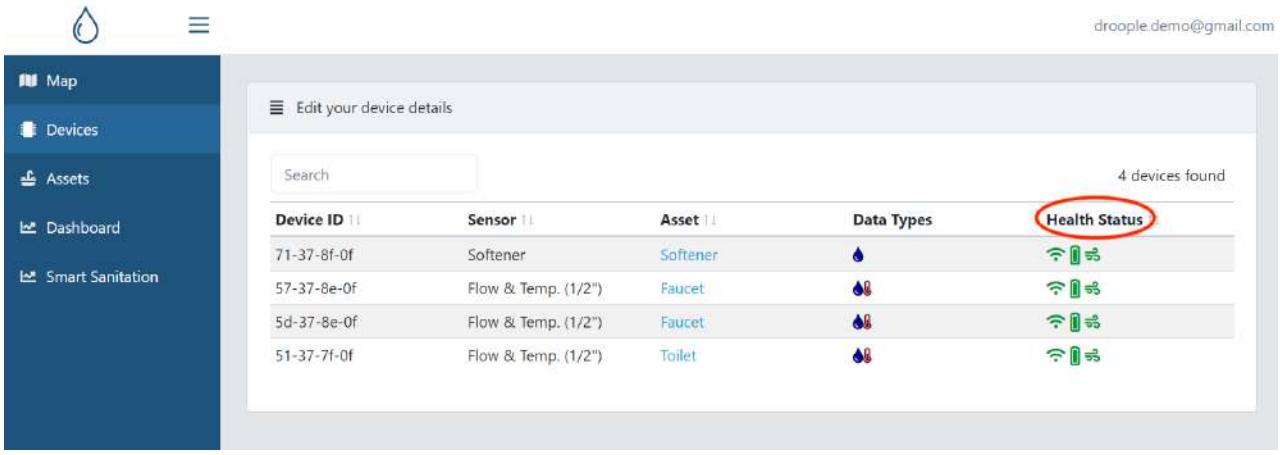
For **water treatment assets** like filters, use the IN and OUT *Stream direction* property to distinguish the water coming inside the filter from the treated water going outside of the filter.



Avoid using the stream direction or temperature fields if not needed (e.g. for a toilet).

F. Monitoring the health status of your devices

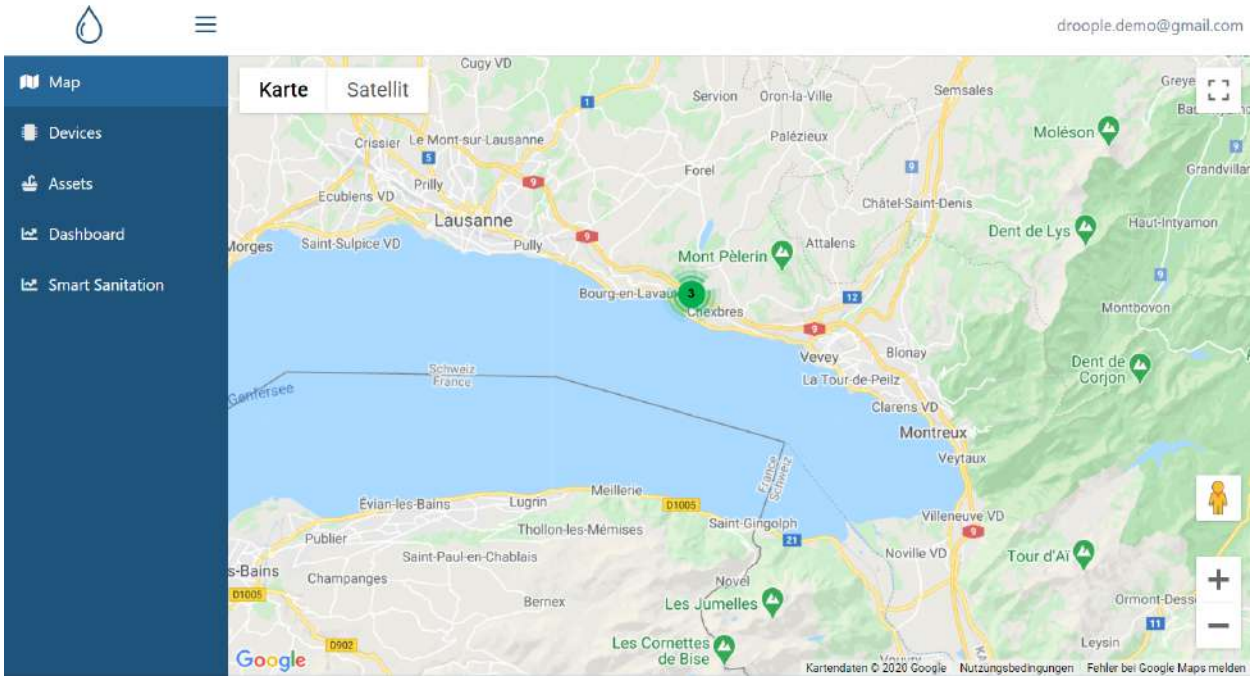
The health status is displayed for each asset and each device on their respective listing pages. A detailed explanation of the symbols and colors is given in the Troubleshooting section of this manual. Hovering with your mouse on the icons will show you more information about each indicator, such as the last time the platform received a message from the device or the last recorded battery voltage.



G. Locating your assets on a map and monitoring your devices health status

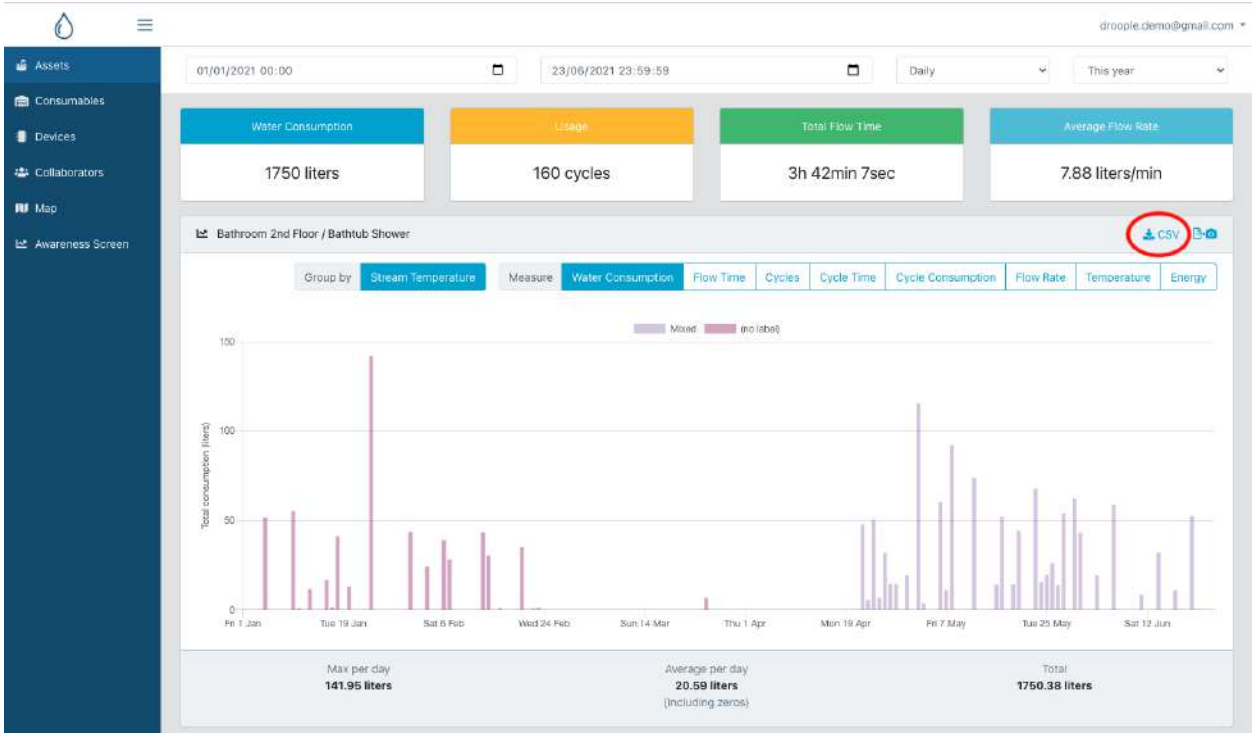
You can use the *Map* view to visualize your assets on a map. Assets in the same area are grouped together, and the number of assets grouped together is shown on the cluster icon . The color of the cluster icon indicates the worst asset health status in the group:

Asset OK. All health indicators are signaling a healthy status.	Asset requires attention: Some indicators signal a potential issue with the asset.	Asset critical: Some indicators signal a critical issue with the asset.

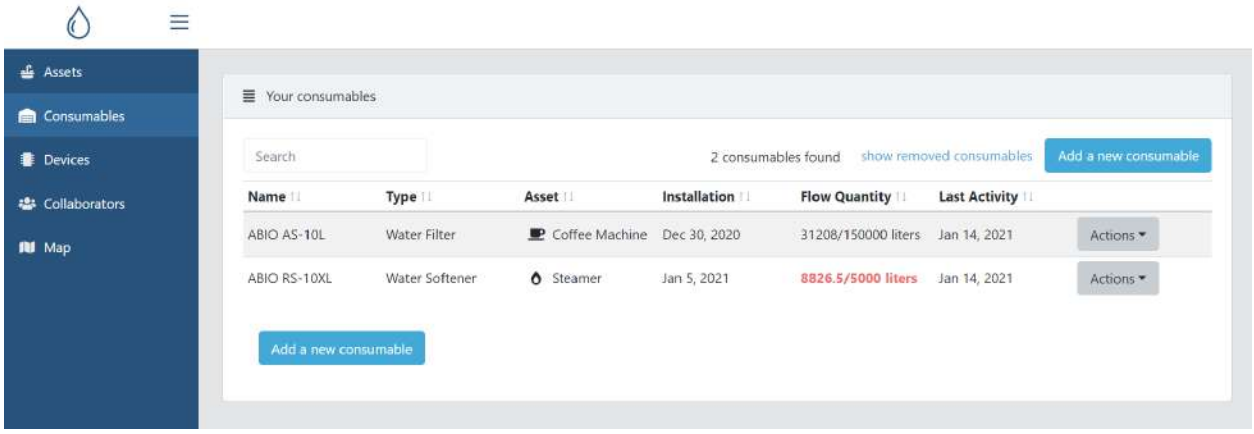


H. Download your data as CSV

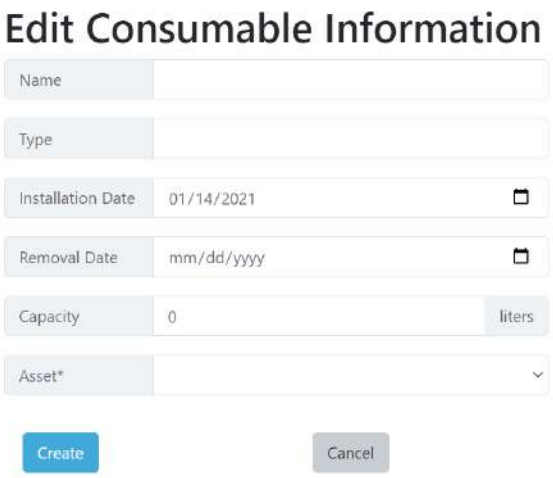
To download your data as CSV (comma-separated values), go to your asset Dashboard and identify the visual with the historical data you want to download. Click on the CSV icon and the file will automatically be downloaded to your computer. If needed, you can then open your CSV file with Excel.



I. Monitor and manage your asset consumables



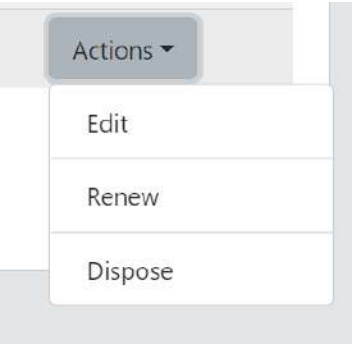
The consumables view allows you to monitor and manage your asset consumables. A consumable is something connected to an asset whose lifetime depends on the flow quantity that was consumed or processed (e.g. the salt for a softener, or a filter cartridge). Consumables which have exceeded their capacity are highlighted in red.



Each consumable has the following characteristics:

- **Name:** a user-friendly name identifying the consumable. For example: the model name of the filter cartridge.
- **Type (optional):** the type is useful to categorize the consumable. Example values could be: Salt, Sediment Filter Cartridge, Reverse Osmosis Membrane Cartridge, ...
- **Installation date:** when the consumable was installed
- **Removal date:** when the consumable was removed. Currently installed filters do not have a removal date.
- **Capacity:** the maximum amount of water the consumable can handle before needing replacement or maintenance. To disable the capacity, set the value to 0.
- **Asset:** the asset to which the consumable relate

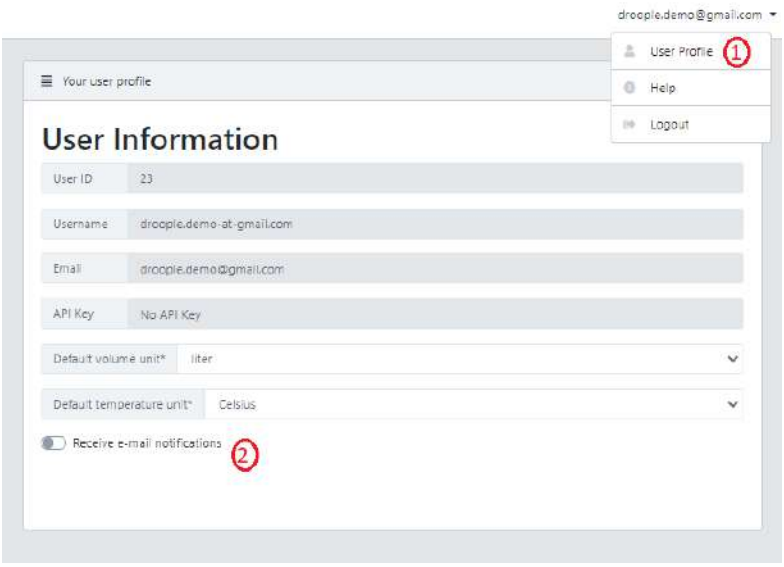
For each consumable, you find an *Actions* menu to perform several operations:



- **Edit** the consumable details such as installation and removal date, as well as the maximum capacity.
- **Dispose** the consumable: this operation sets the removal date of the consumable to the current date of the day, moving it to the removed consumables list. This operation is performed when the user removes the consumable without installing a new one.
- **Renew** the consumable: this operation disposes the consumable by setting its removal date to the current day (if not already removed) and creates a new consumable with the same characteristics (name and capacity) but with an installation date set to the current day. This operation is performed when the user replaces the consumable of the asset.

J. Enabling and disabling email notifications when a device is not functioning properly or when a consumable reaches its end of life.

To enable or disable email notifications, go to your profile settings and enable/disable the notifications:



You receive a notification when:

- The battery of a device is low
- The connectivity with the platform has been lost
- A consumable has reached its maximum flow capacity

By default, notifications are turned off for all new users.

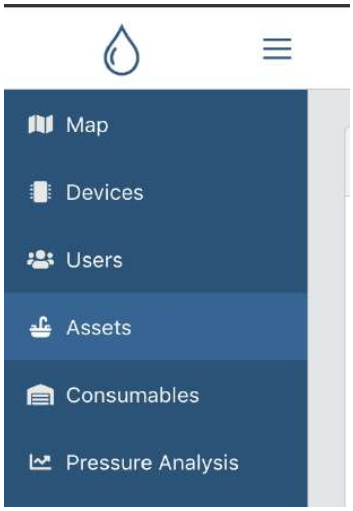
K. Accessing the API and its documentation

If you have received an API key, it will be available from your profile settings page. You can request an API Key and the documentation by email at support@droople.com.

4. Troubleshooting

a) Health Status

The Health Status helps you to identify eventual problems with your device. To access the Health Status information, click on **Assets** in the sidebar menu of the Droople App.



In the column **Health Status**, three icons represent the health of your device.

Depending on your device's status, the icons will change color (green, orange, or red). A tooltip is available for each icon explainings its meaning when you drag the mouse over it.

Signal Health Status

The first icon represents the signal health status. It checks if a signal has been received from your device recently. The icon will be green if a signal has been received over the last 24 hours. Otherwise, the icon turns red.

Signal OK. A signal has been received over the last 24 hours	Signal to follow. No signal received since more than 24 hours but still in the last 48 hours range.	Signal not OK. No signal received over the last 48 hours.

Battery Health Status

The second icon represents the battery health status. It checks the voltage of the battery in your device. The icon will go from green, then orange to red depending on the voltage measured. When the battery health status turns to red, the battery of the iLink should be replaced to continue the monitoring of your asset.

Battery OK. The battery has sufficient voltage.	Battery critical. The battery should be changed as soon as possible.

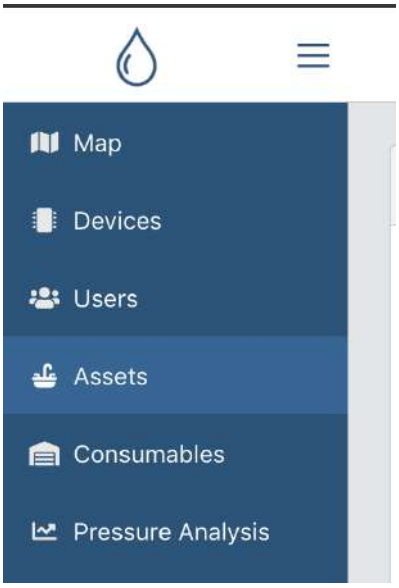
Flow Health Status

The last icon represents the flow health status. It indicates if the sensor in your device has measured water flow recently. The icon will be green if a flow has been measured over the last 7 days, orange if a flow has been measured during the last 7-14 days. Otherwise, the icon turns red.

Flow OK. A flow has been measured over the last 7 days.	No flow detected during the last 7 days	No flow detected over the last 14 days

b) No data received in the Droople App

If, after 24 hours, the data in your dashboard has not actualized even though water has flown into the sensor, check your device's health status.
In the Droople App, under **Assets**, look for your asset and check the column **Health Status**.



In the column **Health Status**, look at the color of the three icons representing the signal, the battery, and the flow health status.

There are three main causes for not receiving data in the Droople App:

The signal is not received correctly from the device

In this case, the signal health status icon will be red, indicating that no signal has been received over the last 24 hours. The most frequent cause for this problem is the gateway.

Check that your gateway is still powered and that it is still connected to the WiFi (the status LED should be solid green). For more information about the gateway, see the chapter MiniHub Gateway.

If the gateway is powered and connected to the WiFi, reboot it by removing it from the wall plug and put it back. Then let some water flow through the sensor, wait 10 minutes, and check again the Droople App.

If you still did not receive any data, the device should be rebooted. To reboot the device, open the enclosure, remove the battery, and put it back. For more information about removing the battery, see the chapter How to change the battery.

The reboot takes about 10 minutes to be fully completed.

If, after the reboot of the device, you still do not receive any data in the Droople App, please contact us at support@droople.com

The device is out of battery

In this case, the signal health status icon and the battery icon will be red, indicating that no signal has been received over the last 24 hours and that the battery is in critical condition. This combination means, in most cases, that the device is out of battery.

To replace the battery of the device, follow the steps described in the chapter How to change the battery.

After replacing the battery, the device will reboot, and the data in the Droople App should be updated within 10 minutes.

New batteries can be ordered at www.droople.com/product/batteries

The sensor is not installed correctly

In this case, the flow health status icon will be red, indicating that no flow has been measured over the last 14 days. If you just installed the device with the sensor, this means, in most cases, that the sensor has been installed in the wrong direction.

Go to your asset where the device and the sensor are installed, and check that the arrow on the sensor points toward the direction of the flow.

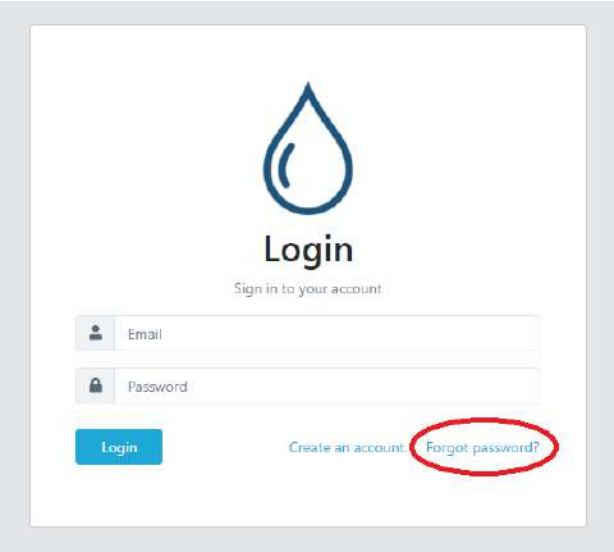
If the arrow points in the opposite direction of the flow, the sensor is not installed correctly, and the device cannot read the water flow. Re-install the sensor in the correct direction and let the water flow in your asset for at least 5 seconds. Within 10 minutes, you should see updated data in the Droople App.

Depending on the asset, the installation of the sensor should be made by a professional plumber and may require additional fittings.

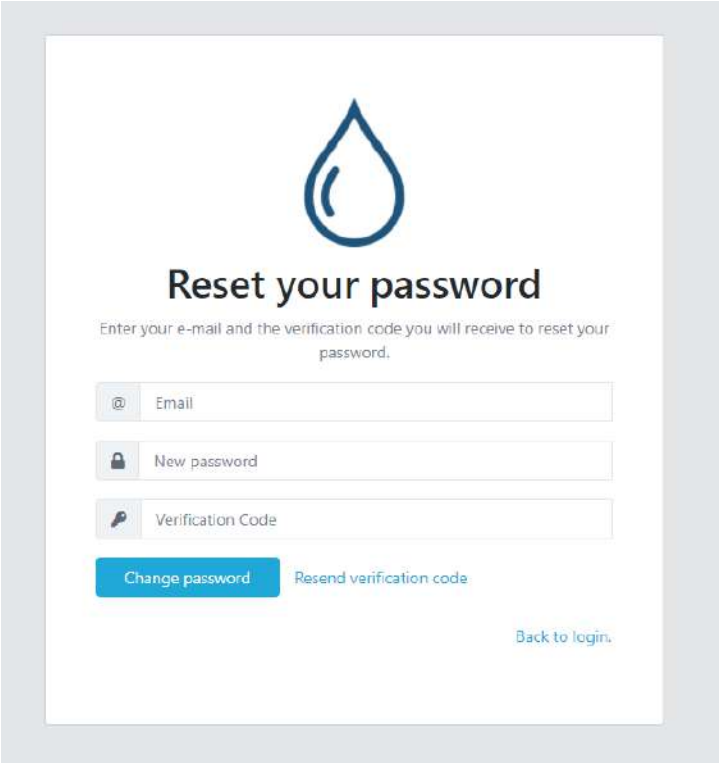
If, after re-installing the sensor correctly, you still do not receive any data in the Droople App, please contact us at support@droople.com

c) Changing or resetting your password

To reset your password, go to the login page and click on “Forgot password?”



You will then enter your email address, to which you will receive a verification code. Enter the code, and set your new password.



You will then be redirected to the App.

d) The number of cycles counted is not correct / my cycles are not detected

If the App doesn't count the number of your assets' usage cycles correctly, it could be because the flow rate is not high enough to trigger a cycle detection. The minimum cycle detection flow rate depends on your sensor size:

- For ½ inch, the minimum flow rate is 0.8 liters/min
- For ¾ inch, the minimum flow rate is 3.4 liters/min
- For 1 inch, the minimum flow rate is 6.7 liters/min

e) Low flow rates are not reported

If the App doesn't measure your asset's flow rate correctly, it could be because the flow rate is not high enough to trigger a measurement. The minimum flow rate depends on your sensor size:

- For ½ inch, the minimum flow rate is 0.08 liters/min
- For ¾ inch, the minimum flow rate is 0.34 litesr/min
- For 1 inch, the minimum flow rate is 0.67 liters/min

f) The flow rate or the flow quantity reported is sometimes excessively high

Unfortunately, with our current design, if some messages are lost during the transmission while a flow is running through the sensor, then the associated flow rate will be corrupted. The values shown will be inaccurate (too high). Similarly, for the flow quantities, the instantaneous flow consumption (i.e., the amount of water consumed at a specific moment in time, for example, during one hour) will represent an accumulation of all the flow quantities that were not transmitted before. However, please note that this only applies to the flow rate and the instantaneous flow quantity. The total (cumulated) flow quantity should remain correct.

g) Very large or very small flow quantities are not measured correctly

The flow range covered by the sensors varies depending on their size. If your measurements do not match your expectations, please check that you are within the operational range:

- For ½ inch, the flow range is 0.4-20 liters/min
- For ¾ inch, the flow range is 2-30 liters/min
- For 1 inch, the flow range is 3-45 liters/min

5. iLink

a) Technical specifications

- Communication[1]: LoRaWAN (EU868, US915)
- Reading inputs: 2 analog or 2 digital sensors (I2C)
- Battery: 2600 mAh (lithium)
- Lifetime: up to 10 years (with a measurement frequency of 5 minutes)
- Connectors: cable with M8 female connector
- Enclosure material: ABS
- Dimensions: 95x54x33 mm
- Weight: 85 gr
- Certification: CE/FCC/IC

b) Where to install the iLink

Although the enclosure of the iLink is waterproof (IP 67), place the iLink in a way that no water can leak onto it. Therefore, the iLink should ideally be installed above water connection points. Zip ties or double-sided tapes can be used to secure its position.

[1] The iLink requires a LoRa gateway to function properly.

c) Where to order new batteries

Spare batteries can be ordered from our website at www.droople.com/product/batteries

d) How to change the battery

Warning: a working gateway (powered and connected to internet) must be in the same room as the iLink when changing the battery

1. Remove the 3 screws from the lid with the screwdriver provided and open the device.

2. Locate the battery connector.

3. Place the battery inside the connectors and make sure that the indicated polarities match the ones from the battery.

4. Once the battery is installed, the device restarts automatically.
5. Close the lid and put back the screws in place.

6. MiniHub Gateway

a) Technical specifications

- LoRa-Chipset: Semtech SX1308
- LoRa-Channels: 8 Channels
- LoRa-Frequencies: EU868 (862-870 MHz) or US915 (902-928 MHz)
- LoRa-Receive Sensitivity: -140/-135 dBm (EU/US)
- WiFi-Mode: 802.11 b/g/n, Client Mode
- WiFi-Tx Power: +20 dBm
- WiFi-Frequency Bands: 2.4 GHz
- WiFi-Security: WPA/WPA2
- Dimensions: 90x80x40mm
- Weight: 200g
- Operating Temperature: 0-40°C
- USB Port: USB Type-C (900 mA)
- Certification: CE/FCC/IC/RCM/WPC/RoHS

b) Where to install the gateway

The gateway should be installed indoors and ideally in the same room as the device(s). The iLink signals can be emitted over long distances. Placing the MiniHub gateway close to it guarantees a good signal quality and will prolong the battery lifetime of the iLink.

c) Operating Modes

Configuration Mode (CONF)

In this mode, the device acts as a WiFi Access Point to which users can connect and configure a WiFi network(s) to which the gateway will connect during regular operation. The device cannot route LoRa packets in this mode.

Gateway Mode (GW)

In this mode, the device acts as a gateway to route traffic between the iLink and the WiFi Network. The WiFi Access Point for configuration is not available in this mode.

d) LED states

Color(s)	Illuminating Pattern	Operating Mode	Meaning
GREEN	Blinking (freq. 1 sec.)	GW	WiFi not connected (or trying to connect)
GREEN	Blinking (freq. 1/4 sec.)	GW	Connected to WiFi, establishing a connection to LNS/Configuring radio
GREEN	Solid	GW	Connected to WiFi, connected to LNS backend, listening for data packets
GREEN/RED	Alternate blinking (freq. 1/4 sec.)	CONF	Scanning WiFi networks, setting up Config Access Point
RED	Blinking (freq. 1/4 sec.)	CONF	Config Access Point active

e) Button Actions

There are three possible button actions on the MiniHub gateway

- SETUP Button pressed for 10 seconds:
    - Switch to CONF mode if in GW mode.
- RESET Button pressed for 5 seconds:
    - Reset the gateway to factory settings (wipe out WiFi and LNS credentials, though CUPS credentials are retained).

7. Flow & Temperature sensor

a) Technical specifications

	Size ½”	Size ¾”	Size 1”
Flow range	0.5-20 liters/minute	2-30 liters/minute	4-45 liters/minute
Temperature range	0-65°C		
Process pressure	max. 17.5 bar		
Connection type	male G ½” or male NPT ½”	male G ¾” or male NPT ¾”	male G 1” or male NPT 1”
Material in contact with water	Stainless steel (1.4401), POM		
Connectors	M8 male connector		
Sensing technology	hall effect and 50K thermal resistor		
Dimensions	60x21x21 mm	60x26x26 mm	60x34x34 mm
Weight	120 gr	140 gr	230 gr
Certification	CE/WRAS/FDA/RoHS		

b) Where to install the sensor

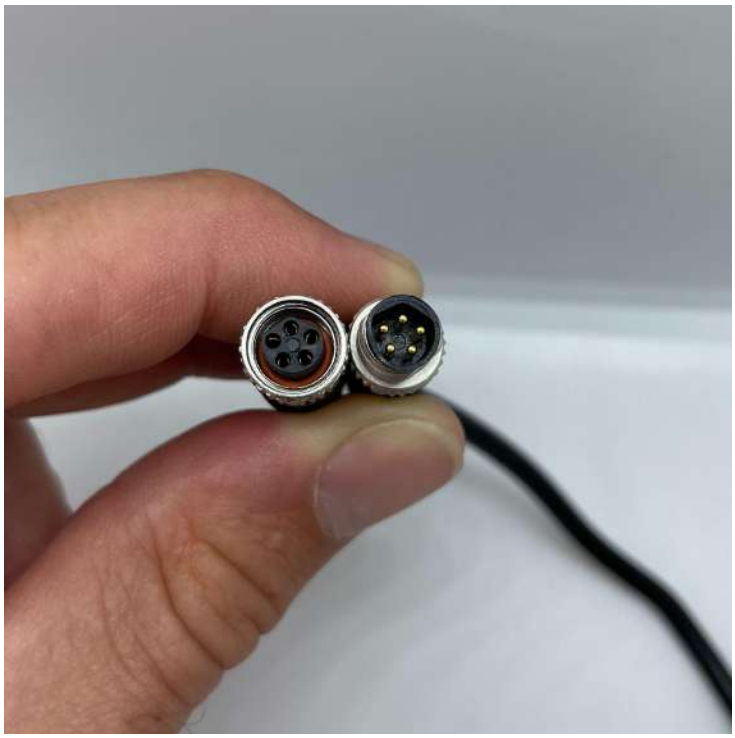
The sensor can be installed almost anywhere where there is a water-based asset. Typical installations include:

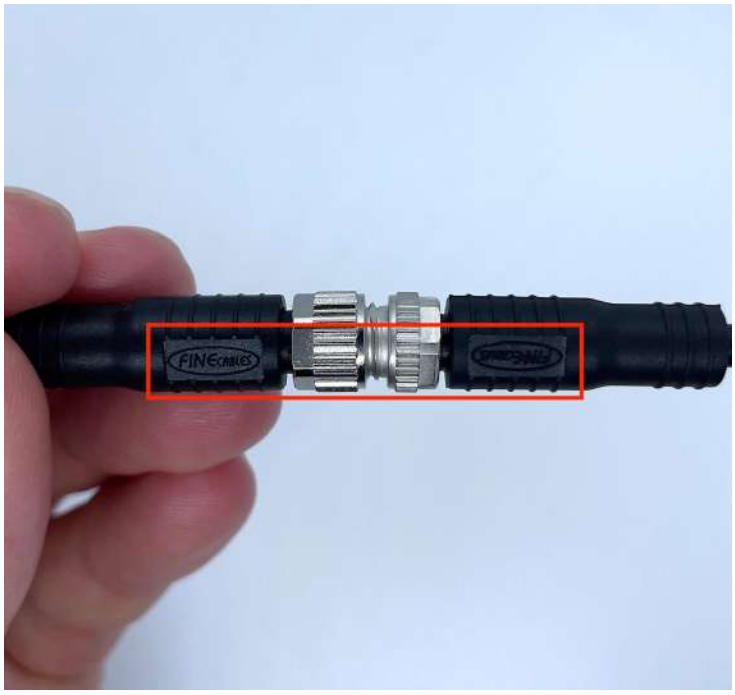
- Faucet tap (hot & cold monitoring with our Twin kit)
- WC
- Shower
- Outdoor tap (for watering the garden)
- Coffee machine
- Filter (sediment or any type of water filters)
- Water softener

Depending on the asset, the installation of the sensor should be made by a professional plumber and may require additional fittings.
During the installation of the sensor, make sure that the arrow on the sensor corresponds to the direction of the water flow.

c) Sensor connection

Connect the sensor to the iLink using the M8 connectors cables.
Be careful to plug the cables in the correct way and make sure that the signs on the two cables are aligned (see pictures below)




FINEcables

8. Regulatory Statement

a) FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

Note: This product has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this product does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment should be installed and operated with a minimum distance 20cm between the radiator and your body.