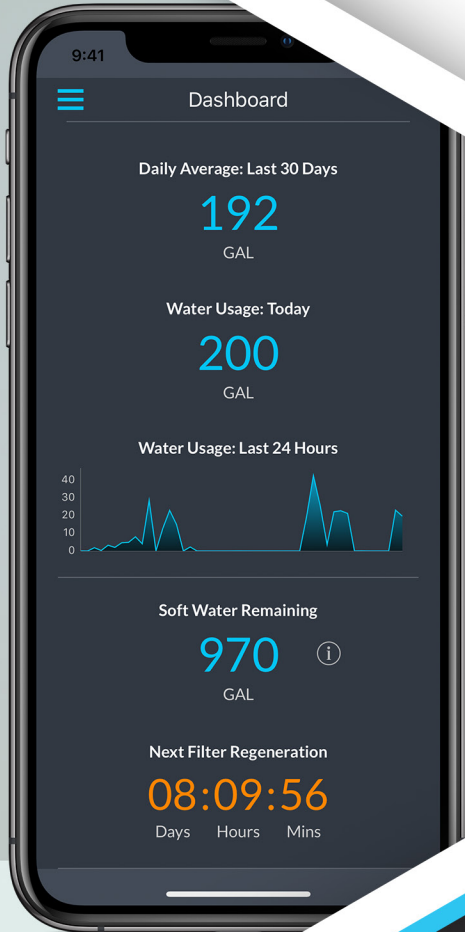


DROP

PROTECT WHAT MATTERS



User Guide

Getting started and operating your new system and mobile app

INTRODUCTION

Thank You for Purchasing a DROP System!

We know you'll love your improved water quality, leak detection ability and water conservation benefits of your new DROP Water Management System from Chandler Systems. You'll soon wonder how you ever lived without it. Improving your water and protecting your home are just a few of the ways that the DROP Water Management System can improve your water system.

Be sure to check out the dropconnect.com website periodically for more information about additional DROP products as they are released.



888.363.9434



dropconnect.com

To further help you operate your new DROP system, we have provided you with many other resources for you to learn more. Feel free to call Chandler Systems when you need additional help. We also have many resources located on our website including instructional videos, and images.

DROP Connect is also active on various social media pages! Feel free to follow us for the most up to date information and news!



@dropconnect



Privacy Statement

For more information about privacy, visit our [privacy policy](#) online.

DROP Patents

For the most up-to-date list of patents, visit our patents on our website: dropconnect.com/patents.

FCC Compliance Statement:

https://dropconnect.com/sites/default/files/FCC_Compliance_Statement.pdf

Industry Canada Compliance Statement:

https://dropconnect.com/sites/default/files/Industry_Canada_Compliance_Statement.pdf

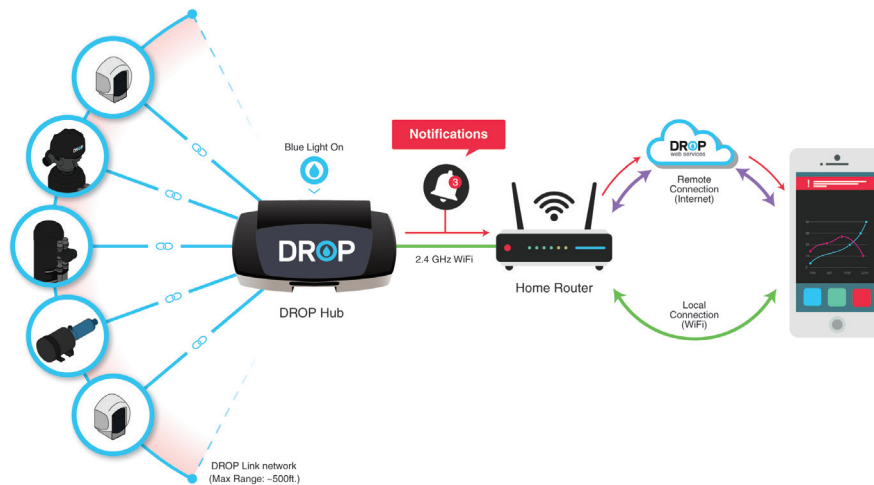


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ABOUT

The DROP system has been designed to be your home water management system. It treats your incoming water supply to give you quality water in your home. It monitors water usage and can help to alert you to excessive water usage and prevent or reduce water damage in the event of a burst pipe or a failed appliance. The DROP system can be tailored to your home's unique needs and your personal desires.



The DROP devices that are a part of your home water system are coordinated and controlled by the DROP Hub. The DROP system uses a proprietary wireless network called DROP Link that operates all the devices on a network. DROP Link is separate from and on a different frequency from your home WiFi. This gives the system resilience in that even if your WiFi or internet goes down, your DROP system will continue to operate, monitor and protect. It also keeps unnecessary traffic off your WiFi network.

The Hub is the only component that has a WiFi radio on it. You can connect to in 3 modes that give a user complete flexibility to set up their DROP system to best suit their needs and desires.

1. **Direct connection:** the DROP Hub creates its own secure WiFi network. Using the DROP app on a smart phone or tablet you can connect directly to the Hub and view status and change settings. This mode allows someone who may not have an internet connection to still be able to take advantage of many of the features of the DROP system.
2. **Local WiFi connection:** is very similar to direct connection mode, with the advantage of being able to connect to the DROP system without having to change the WiFi network on the smart phone or tablet being used to connect.
3. **Cloud connected** using DROP Connect web services. This allows the DROP Hub to connect securely to DROP Connect servers. This enables notifications to be sent when there is an event that you need to know about and it allows you to monitor and control the DROP system from anywhere that you have an internet connection.

The DROP system makes it easy to add to your system as the needs of your home change and as the DROP product line continues to expand. Adding a new device to the DROP network is as easy as setting the Hub to look for new devices, and then power up the device you would like to add. Your new device will be connected to the system and your DROP Hub will already know how to integrate it into the system.

The DROP system user interface is implemented using the "DROP Connect" App. The App is available for Android and Apple smart phones and tablets. This gives you the convenience to have an intuitive user interface that is always with them. You no longer need to be standing in front of the equipment trying to figure out how to change the settings using a few buttons and cryptic text. The App includes many helpful hints and full descriptions of system settings and operation so you are not guessing as to what the information or settings are about.



BEFORE YOU BEGIN


Before you get started, there are few things you are going to need to do.



Install your Water Appliance(s) First!

It is recommended that you plumb your water appliance(s) into your water system **before** powering your DROP system. Please see the documentation regarding the installation of your particular water appliance(s) that you are installing for specific installation instructions related to that device.

Download the DROP Mobile App

The DROP Mobile App can be found on both the Apple® Store and Google Play store. Just search for “DROP Connect” and look for the DROP icon  or, here are quick links to the app.

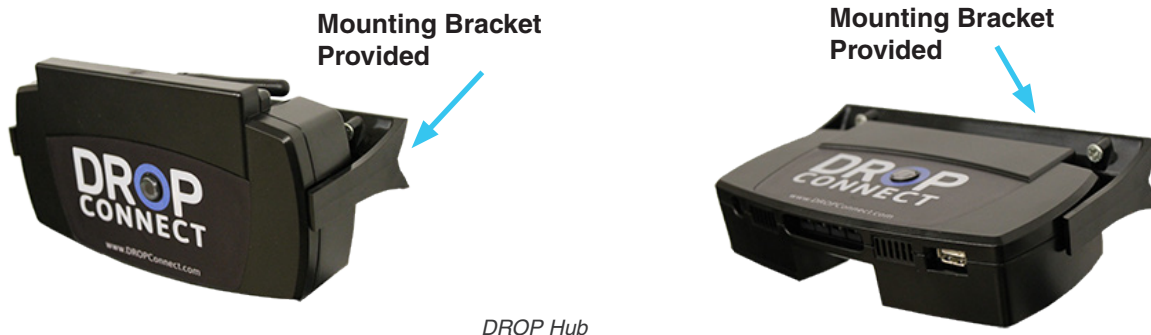
Apple Store: <https://itunes.apple.com/us/app/drop-connect/id1269747593?mt=8>

Google Play: <https://play.google.com/store/apps/details?id=com.chandlersystemsinc.dropconnect>



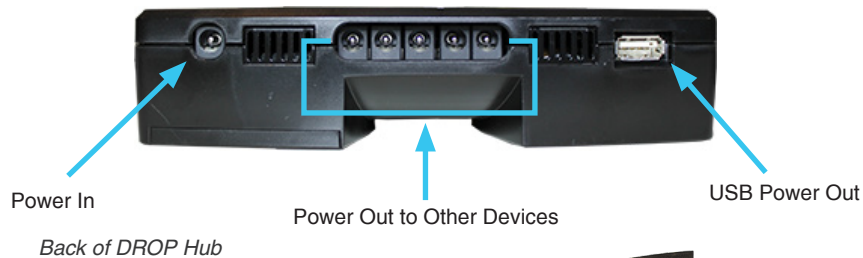
Place your DROP Hub

The DROP system is a wireless operating system making placement of the Hub very flexible. However there are a few things to keep in mind when you locate the Hub. If you are planning to connect your Hub to your home WiFi be sure to place the Hub within range of that network. The range of the DROP Link network gives adequate coverage to a majority of homes without the use of repeaters. Any device on the DROP network that is powered from an outlet power source can act as a repeater. However, placing your DROP Hub in a central location in your home gives it the best chance of being able to reach all the devices on the network without the need for DROP repeaters.



BEFORE YOU BEGIN CONT.

Another feature to be aware of when placing the Hub is that the DROP Hub can power up to 5 additional DROP products. That is useful when there are not enough outlets to power all of the devices in an area with the provided power supplies. An example of this could be where a softener with a salt sensor, a backwashing filter and the Hub are all installed in a mechanical room. You can power the Hub with the provided power supply then connect the other devices to the Hub using the optional power distribution cord.



10 ft. power distribution cord available to power DROP devices from the hub (p/n: 20018X040)



9 volt battery back up is recommended for DROP Hub

The hub also has a USB power output. This output can be used for slow charging of a tablet or phone. This is especially useful for our cabinet model where a tablet can be used for the purpose of being the user interface for the DROP system. The hub can keep the tablet charged and always ready for use.



DROP cabinet softener shown with tablet and hub (tablet purchased separately)

Once you have decided on a location for the Hub, you can plug it in. The Hub comes with a larger power supply than the other DROP devices. The Hub should be powered by a 12VDC 2,000mA power supply. It should be plugged into a non-switched 120v outlet. When first powered up, the Hub light will be yellow.



BEFORE YOU BEGIN CHECKLIST

Quick Checklist

Before you continue with installation, let's make sure the following steps have been completed.

You have:

- ✓ Installed or plumbed in your Water Appliance(s)
- ✓ Downloaded the DROP Mobile app on your smartphone
- ✓ Placed the DROP Hub in a central location and powered it up



GUIDED SETUP FIRST ITEMS



Easy Configuration

Nearly all configurations and options are located in the DROPS Mobile App! This section will walk you through the mobile setup to get you up and running!

Guided Setup

This guided setup process will connect your smartphone and DROPS Connect App to your DROPS system. If desired, it will also connect your DROPS system to your WiFi network and create an account on DROPS Web Services. This process is necessary to control your DROPS system.

First launch of Mobile App

By simply starting the DROPS Connect App for the first time, it will step you through the guided setup process.

If you need to get back to the guided setup process, you can choose “Guided Setup” from the account login page or the Account page in the app.

The following pages will help identify your home network setup and give you detailed instructions for how to get your system setup. For Apple iOS and Android devices, some steps will differ between the mobile operating systems.



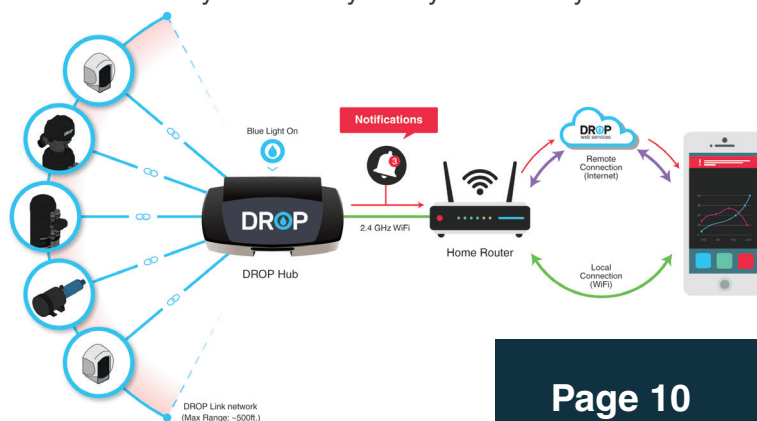
GUIDED SETUP YOUR HOME SETUP

Your Home Setup

DROP is a very dynamic system capable of working in any existing network environment. Whether or not you have an existing home WiFi network, you will be able to complete your setup and you can change your network settings later. Select your current setup below.

I have WiFi internet

DROP has many features that work with your existing home network. This includes mobile notifications and remote controls when you are away from your water system.

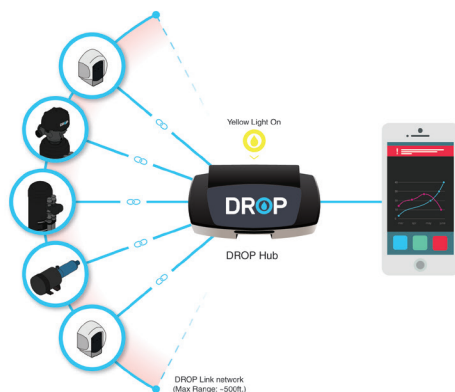


Page 10



I do not have WiFi internet

DROP has the ability to work without any existing internet. This section will walk you through direct connection mode which lets you control your water system when in close range.



Page 12



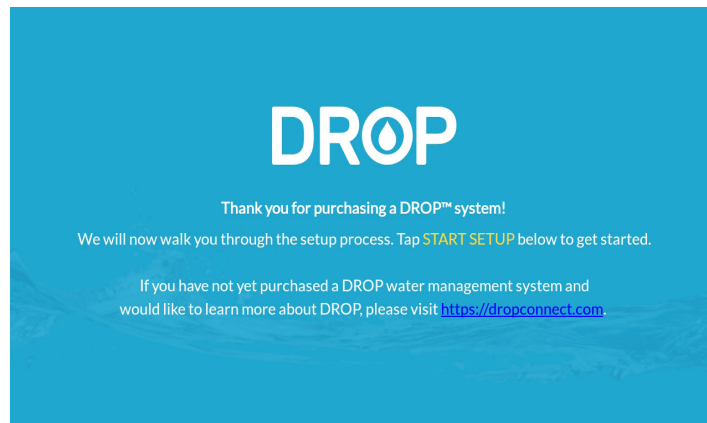
I am a Contractor installing DROp for someone else

Refer to Professional
Installer's Guide

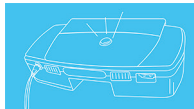
GUIDED SETUP WITH EXISTING NETWORK

Guided Setup with Existing WiFi Network

The guided setup process will help you connect your DROP system to an existing home network, and then configure your DROP system to enable remote access. Simply follow the instructions in the app and network configuration of your DROP system can be completed in just a few minutes.



Guided Setup Overview



Power on your DROP hub – the light on the hub will indicate when it is ready for configuration.



Connect your phone or tablet to the DROP hub – the app will ask you to press the button on the hub to pair the app with the hub. Simply follow the instructions in the app.



Select your WiFi network from the list of available networks – after you enter the WiFi password, the app will connect the DROP hub to your WiFi network.



Create a DROP Web Services account and enable remote access – with remote access enabled, you can access and control your DROP system from anywhere you have an internet connection. This also allows DROP to send you notifications if there are any issues with your DROP System.

GUIDED SETUP WITH EXISTING NETWORK



One Time Setup

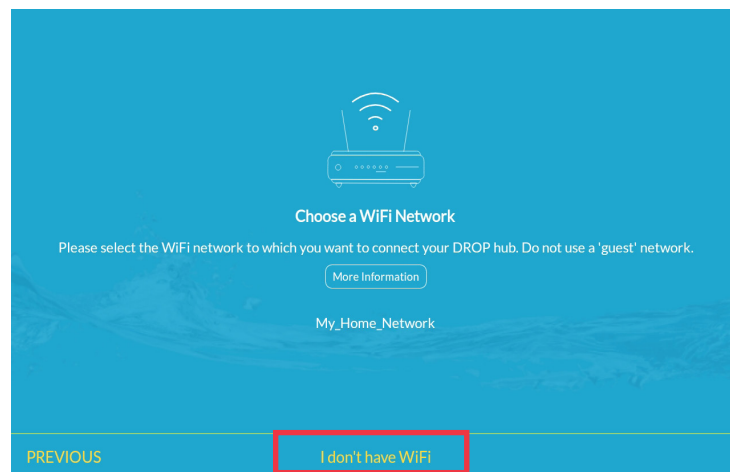
This hub setup process is a one-time installation and you will not have to perform these steps again in the future. Your DROP hub will remain connected to your WiFi network for easy access from the DROP Connect app.

If your WiFi network name or password changes, you can repeat this guided setup to get your DROP hub connected to a new network. For other issues and troubleshooting, please reference the Troubleshooting section on page 16.

GUIDED SETUP WITH NO NETWORK

Guided Setup With No Home Network

If you do not have a home WiFi network, follow all the steps in the guided setup process described on the preceding pages until you see the prompt “I don’t have WiFi”. The guided setup process will finish, and you can connect directly to the DROP system.

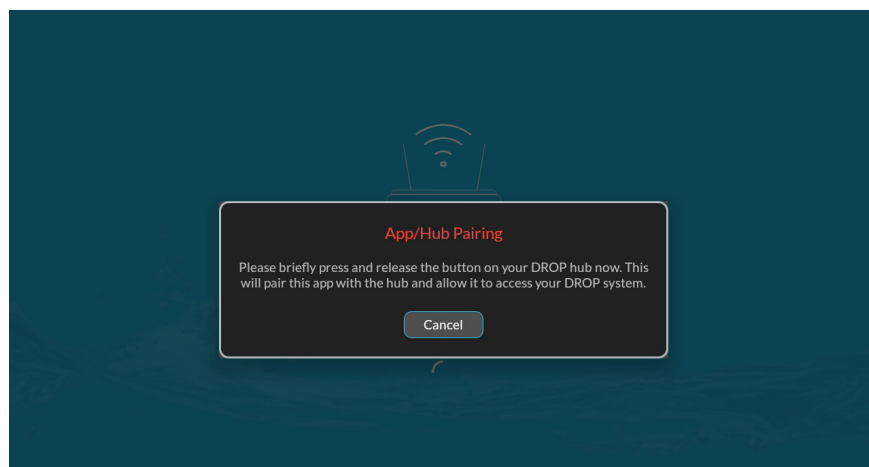




APP / HUB PAIRING

PAIRING

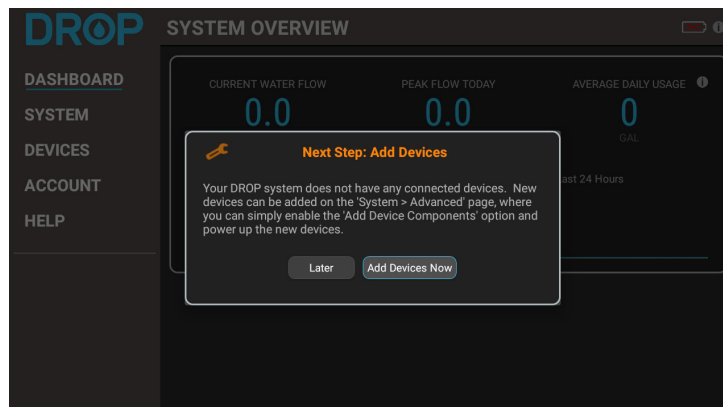
The DROP hub will only communicate with the DROP Connect app on devices that have been paired with the hub. When the app on a new device attempts to communicate with a DROP hub for the first time on a local network connection, it will prompt the user to press the button on the DROP hub to authorize the connection from that device. Once paired, the app will be able to communicate with that hub. If a user is logged into the DROP Connect app and can connect to the hub remotely, this pairing process will happen automatically, and the user will not need to press the button on the hub.



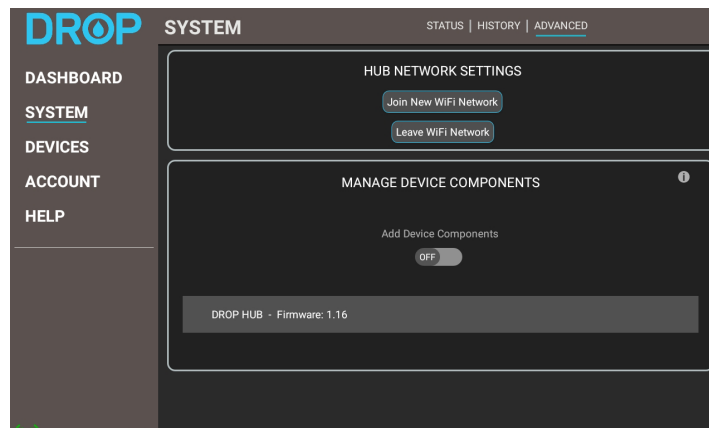
ADDING AND NAMING DEVICES

How to add your devices

To add new device components using the app, you must be connected locally to the DROP Hub that you wish to add components to. Make sure that in the app you have a green connection icon in the lower left corner of the Navigation menu. If not, see the section “Local Connection vs. Remote Connection”.



If no devices have been added to the Hub, the app will prompt you to “Add Devices Now”. This will take you directly to the SYSTEM > ADVANCED page in the app.



First, unplug and remove any batteries from the DROP device you wish to add. Next, turn on the “Add Device Components” switch by tapping on it. The hub will enter a state where it will accept new connections. Last, immediately power up your DROP device by plugging it in, or inserting batteries. After the device has joined the DROP network you will see it added to the “Manage Device Components” table. You can then disable the ‘Add Device Components’ mode or simply wait for it to automatically disable.

Most DROP devices will be red when not paired and flash white when they are searching for a DROP system to pair to. Leak detectors are the exception; they will flash the network light slowly when not paired and quickly when they are searching for a DROP system to pair to. Once the device joins a DROP system it will show up in the list in the app under “Manage Device Components”. The device will also turn to its default LED color (typically green or blue) or, in the case of a Leak detector, will briefly turn on its green check mark LED.”



Please note that leak detectors will be listed on the SYSTEM > SETTINGS page in the same order that they are added to the hub, which can help keep them straight when it comes time to name them. If you are not sure which leak detector is which, go to the DEVICES > LEAK DETECTORS page and press the Check/Silence button on one leak detector. A green checkmark will appear next to the leak detector that just checked in.



ADDING DEVICES AND NAMING

Adjust System Settings

On the SYSTEM > SETTINGS page are many settings that you can customize to suit your personal water use needs.

The possible settings on this page include:

- Regeneration Time
- System Water Source
- Quiet Time Hours
- High Flow Rate Settings
- Long Flow Settings
- High Total Flow Settings
- System Pressure Settings

Each of the settings has an info icon in the app that you can press if you would like to know more about that particular setting.

Rename DROP system and devices.

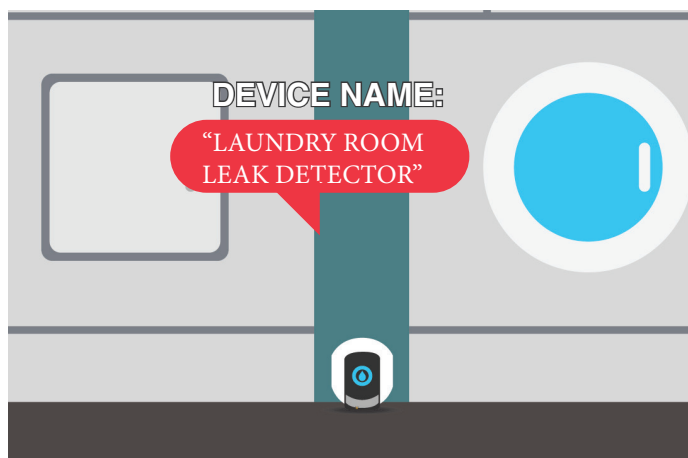
Your DROP system and DROP devices can all be named to make identification easier. This can be done in the SYSTEM > SETTINGS page of the app. Naming your DROP system is especially useful if you have more than one DROP system to manage. Naming your DROP devices can be helpful when you have more than one of the same type of device. A good example of this is when you have multiple leak detectors; you can name one “Utility Room Leak Detector” and another “Upstairs Bathroom Leak Detector”. You will now be able to easily know which leak detector is reporting a leak.



If you are not sure which leak detector is which, go to the DEVICES > LEAK DETECTORS page and press the Check/Silence button on one leak detector. A green check mark will appear next to the leak detector that just checked in.



SYSTEM > SETTINGS



TROUBLESHOOTING WITH EXISTING NETWORK

Router Configuration

If your App is having trouble making a local connection to your Hub there are a few things you can try to remedy the problem.

Troubleshooting Steps

1. Please note that the DROP Hub requires a 2.4 GHz WiFi network to connect to. Also, it should not be connected to a “guest” type network.
2. Confirm that your smart device is connected to your local WiFi network, the same network that the Hub is connected to.
3. When scanning for your DROP system on your network (see page 10) if you press the “Rescan” button repeatedly a dialog will pop up that gives you the option to “Scan Entire Network”. If you are on a home network choose “OK” and then press “Rescan” one more time after it becomes available. This type of scan should find the hub if it is on your network. If you are on a corporate network you should contact your network administrator regarding your problems connecting to your DROP system. Enabling the “Scan Entire Network” may break network rules set up in corporate environments which may in turn remove your phone or tablet from network access.
4. You can try rebooting the Hub by pressing and holding the button on the front. After 2-4 seconds it should turn Pink, release it when it is Pink to reboot the Hub. The Hub may take 30 seconds or so before it will show up in a scan after rebooting your DROP system. You may want to try scanning multiple times.
5. You can try rebooting your WiFi router. Typically, the easiest way to do this is to unplug your WiFi router for 10 seconds and then plug it back in. Routers can take several minutes to restart. Once you have confirmed that your WiFi network is on again, you can try scanning for your DROP system in the DROP app.

Customer Support

The DROP Connect website is full of helpful information. Visit our [Knowledgebase Resources](#) for more information, videos, and other help.

If troubleshooting hasn't solved your issue, Chandler System Customer Support is available to help! Please call: **888-363-9434** for our customer support team.

SET UP COMPLETE

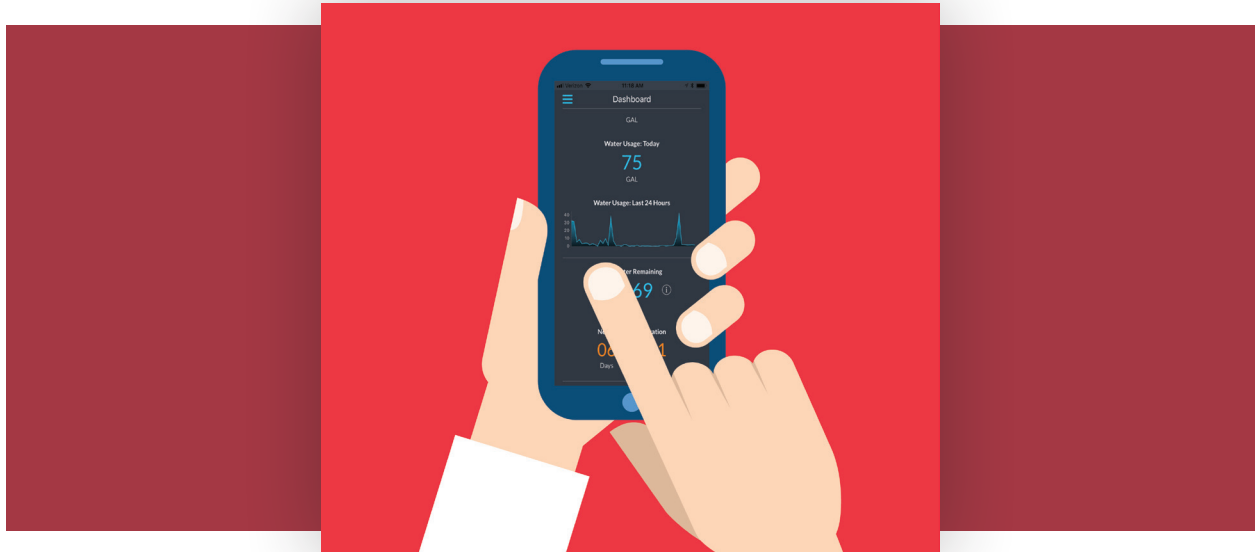


Setup Complete!

You have completed the initial setup of your DROP Device. Your home water is now ready to be controlled anywhere!

The following pages contain more documentation and graphics for further understanding your system. Everything from automating your devices to configuring your notifications can be found in the coming pages.

OPERATIONS MOBILE APP



Using the App

The DROPS App has been designed to organize the many functions and settings of the DROPS system in an intuitive manner. Almost all items in the App can be touched to change settings or to obtain more information. Any item or setting that could cause potential undesired operation will show a confirmation dialog box with more information when the setting is pressed. Also, information icons are available to give you more information about individual settings throughout the App.



Common gestures are used in many areas of the DROPS Connect app. The information icon is also helpful for learning about specific items.

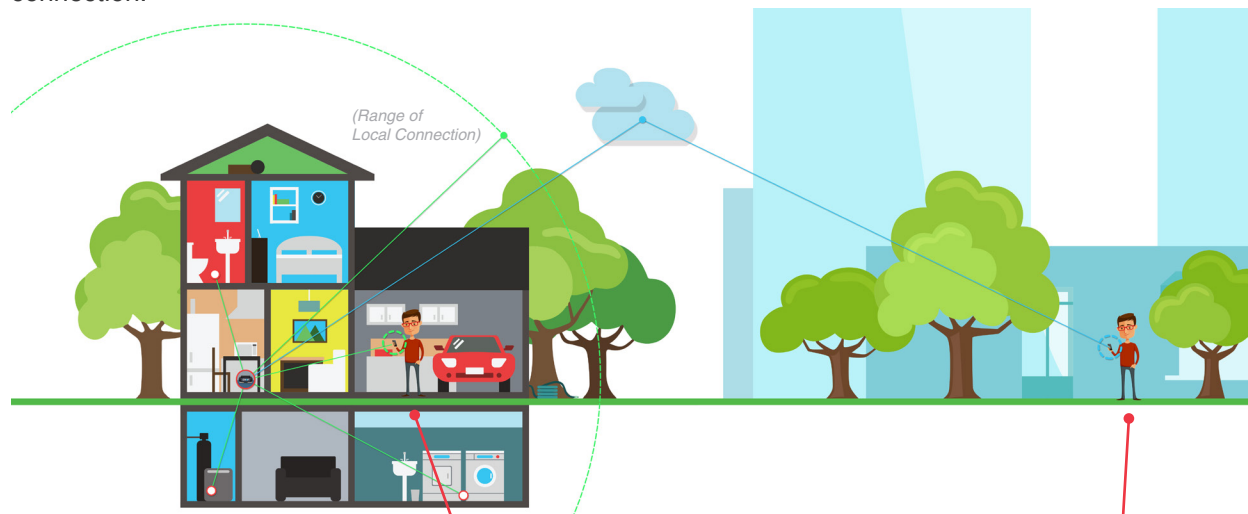
All graphs of data can be expanded to see more detailed information by touching the graph. Once the larger graph view is opened the detailed data can be viewed by pinch zooming and scrolling the graph area. Common smartphone gestures can be used here. Use your fingers to tap, zoom in, zoom out, and move to any area inside the app.



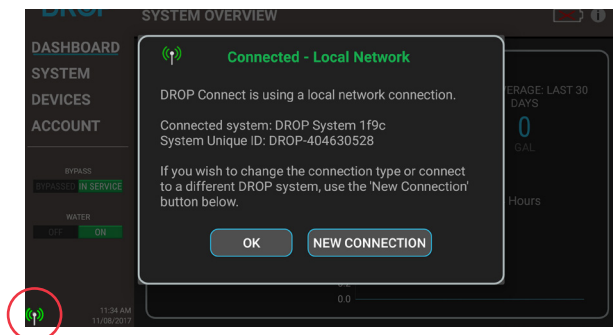
OPERATIONS CONNECTION TYPES

Local Connection vs. Remote Connection

Your DROP App should prefer to connect to your Hub using a local connection rather than the remote connection through the DROP Connect web services. You can tell whether your App is connected in local or remote mode based on the color of your connection icon in the lower left of your Navigation menu in the App. If the icon is green, you are using a local connection. If the icon is blue, you are using a remote connection.

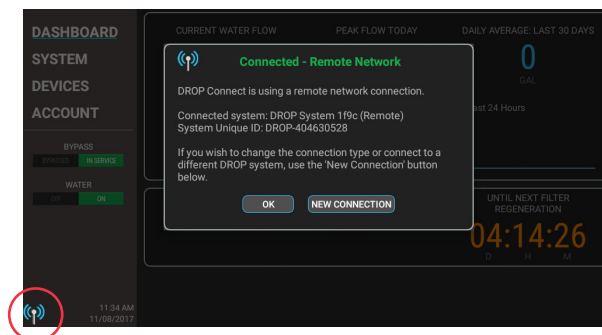


Local Connection



If you are within local range of your Hub, you will direct connect to the Hub. Shown with a Green symbol.

Remote Connection



If you are connected to any mobile network or roaming network, you will connect via remote connection. Shown with a Blue symbol.

A local connection is preferred because it is faster, there are no limitations in functionality and a local connection is required to do firmware updates to the Hub and devices. If your App is connected to your Hub via a remote (blue icon) connection and you believe it should be able to connect locally, tap the connection icon and in the dialog box that pops up tap the “New Connection” button. This will cause the App to scan the network that the phone or tablet is connected to for any DROP systems that are connected. If your DROP system is connected to that same network it should show up on the list.

OPERATIONS DROP HUB - STATUS



DROP Hub Status

Similar to the mobile setup process, DROPHUB can operate in any network environment, with or without WiFi. The color of your DROPHUB light will indicate to you what connection mode it is in. Here is an overview of each mode.

Connected to WiFi and DROPHUB Connect Services



The hub has connected to a local WiFi network and to DROPHUB Connect servers. The Hub is able to accept remote connections. In this mode there are two ways that the app can communicate to the Hub. If the phone or tablet is connected to the same local network as the Hub, the app can communicate directly over that local network.

Connected to WiFi only



The hub has connected to a local WiFi network. To communicate to that Hub using the DROPHUB app your phone or tablet will need to be connected to that same local network.

Direct Connection



The hub is using its own private WiFi network (this is the default state on first power up). To communicate to that Hub using the app your phone or tablet will need to be connected to the DROPHUB WiFi which will be named starting with "DROPHUB_System". Follow the instructions for one of the connection modes in the section "Connecting the app to the DROPHUB system" to have the app walk you through making that connection.

Lost WiFi Signal



The hub cannot connect to the WiFi network it was previously connected to. If this persists for more than a few minutes, check that the WiFi network is available using another device, and make sure the SSID or password of that WiFi network has not changed. If it has not changed and can be connected to using other devices, reboot the hub. If it has changed, set the hub to direct connection mode (see Adv. Hub Pushbutton Functions) and then connect it using the new credentials.

OPERATIONS

DROP HUB - PUSHBUTTON



Hub Push Button

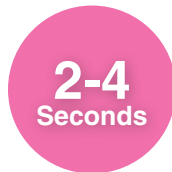
Emergency Water On/Off



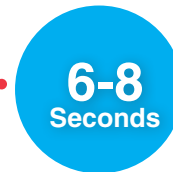
All DROP devices that treat your water also provide a water shutoff for all plumbing that is connected to the outlet of the unit. **Briefly pressing the button on the hub will toggle the water shutoff state.** Although this functionality is also available in the app, simply pressing the button to shut off or restore the water flow is a quick way to change the water shutoff state. When the system is in water shutoff, the Hub light will flash orange once a second over top of its normal status color.

Advanced Hub Pushbutton Functions

The pushbutton on the front of the Hub has been designed to perform some basic functions. By pressing and holding the pushbutton these functions can be accessed. As you hold the pushbutton, the button color will change for the different functions that are available. The following list explains the functions that are available:



The button will turn pink. If released during this time frame the Hub will reboot. This can be helpful if you think something just isn't working right and you want to try a fresh startup to see if it fixes the problem. A reboot takes only a few seconds to complete and is generally not disruptive to any of the normal functions of the system.



If the DROP Hub is connected to a local (blue or green before pressing the button) WiFi network, button color will be yellow. If released during this time frame the Hub will reset and temporarily revert to direct connection WiFi mode. Once in direct connection (yellow with button not pressed) WiFi mode, if button is held again for 6-8 seconds the button color will be blue. If released in this mode the Hub will reset and reconnect to the previous WiFi connection. Switching to direct connection WiFi mode can be helpful if you want to temporarily allow someone to access your Hub, but don't want to give them access to your local WiFi. This also can be helpful if your WiFi router is no longer available and you need to connect to your DROP system. Finally, it is a way that can be used to connect a Hub to a new WiFi without resetting the Hub.



The button will turn green. If released during this time frame the Hub will reset the app pairing key. This will cause all apps that only have local access to the hub to be required to be repaired when they attempt to connect next. When the pairing key is reset, a notification will be sent out that the app pairing key has been reset. The local pairing key ensures that a user must have direct physical access to the Hub in order to connect and also ensures that the appropriate users are notified of the app pairing key change. Note: If a user has remote access to this DROP system, through DROP web services, they will not be required to repair their app to the hub. To control who can remotely access the DROP system go to the "ACCOUNT" page in the app.

Factory Reset

A factory reset will clear all data from the hub and remove any connected devices. Typically, a factory reset is only necessary if suggested by DROP technical support staff. If a hub currently has remote access enabled it is recommended that remote access is disabled before a reset, especially if the hub will be used by someone else. Otherwise, the hub will remain locked to the original account and cannot be used by another account. To disable remote access, go to the Account page in the app and look for the 'Disable Remote Access' button.

To perform a factory reset, first remove the backup battery from the hub. Unplug the hub, depress the pushbutton, and plug in the hub while continuing to depress the pushbutton. After 30 seconds, the button will begin flashing orange and red. Release the pushbutton and the hub will be armed for a factory reset while the button is red. If the button is pressed again while the button is red, a factory reset will be performed. If the button is not pressed again within 10 seconds, the factory reset will be cancelled, and the hub will start normally.

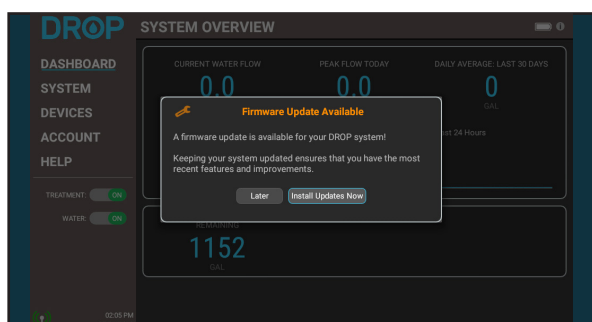


OPERATIONS FIRMWARE UPDATES

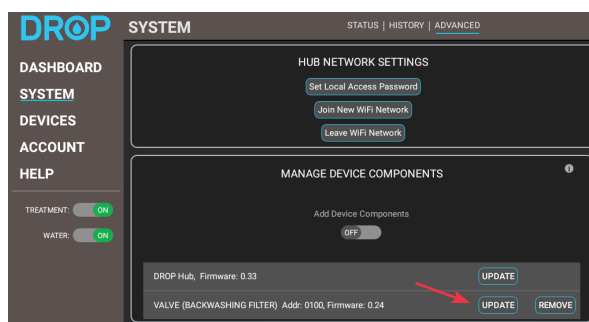
How to Update Firmware

The DROP Hub and all DROP devices have firmware that is programmed on each DROP component and controls how the DROP system operates. The DROP system is designed to be able to update the firmware in order to add new features and fix or improve operation. New firmware updates are distributed in the DROP App and can be downloaded to the DROP system using the app. The app will prompt you that new firmware is available when you open your app and connect to your Hub in local mode. Choosing “Install Updates Now” will take you direct to the **System > Advanced** Page.

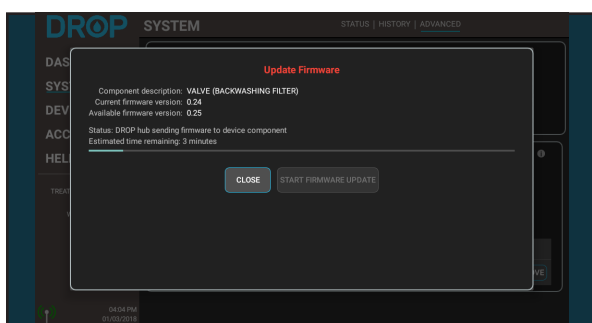
 **System > Advanced**



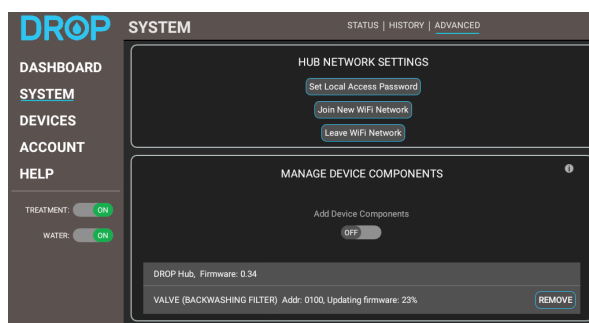
Firmware Updates Pending



Firmware Updates Pending



Sending Hub Firmware Update



Firmware will continue to be transferred. Once complete, the update has been initiated

Any devices that have an update available will have an “Update” button next to them. An available Hub update must be installed before device components can be updated.



NOTE: *The App needs to remain open while the firmware data is being sent to the DROP Hub.*



DROP Remote Overview

Every DROP system sold as a bundle comes with one DROP remote. The DROP Remote shows the status of your DROP system at a glance and allows you to conveniently turn your water supply on or off. The Remote also extends the range of the DROP Link mesh network.

If you have not yet connected your Remote to the system, please see the section “How to Add Your Devices” on page 14.

DROP Remote Placement

If the remote is going to be primarily used as a user interface, it should be hung on a wall or placed on a counter top so it is convenient to see and to control your home water state.

However, if you need to extend the range of the DROP Link network you can place the remote at a location between the hub and the devices you need to extend to. The DROP Remote is a network extender that will improve communications between the DROP hub and distant DROP devices. The construction of every home is different, and you may need to experiment with the location of the Remote to find the optimal placement.

Up to 8 DROP remotes can be connected to a DROP hub as user interfaces and/or network extenders.

Lights

The lights on the DROP Remote indicate if the DROP system is in service or shutoff. While the system is in service, the lights on the Remote will be green. When the system is in shutoff, the lights will change to orange. You can control the behavior of the lights on the Remote in the DROP Connect App.

If there is a DROP notification that has not been seen in the app, the Remote will slowly blink a blue light. As with other DROP devices, periodic purple flashes indicate that the Remote is communicating with the DROP hub and other DROP devices.



NOTE: *The notifications or network activity indication must be enabled in the App to be visible on the Remote.*

Pushbutton Functions

The DROP Remote has a recessed, touch sensitive button that can perform some basic functions. These functions can be accessed by pressing and holding the button. As you hold the pushbutton, the light closest to the button will turn white to confirm the button press, and the top lights will change for the different functions available. The following list explains the functions that are available:



OPERATIONS DROP REMOTE



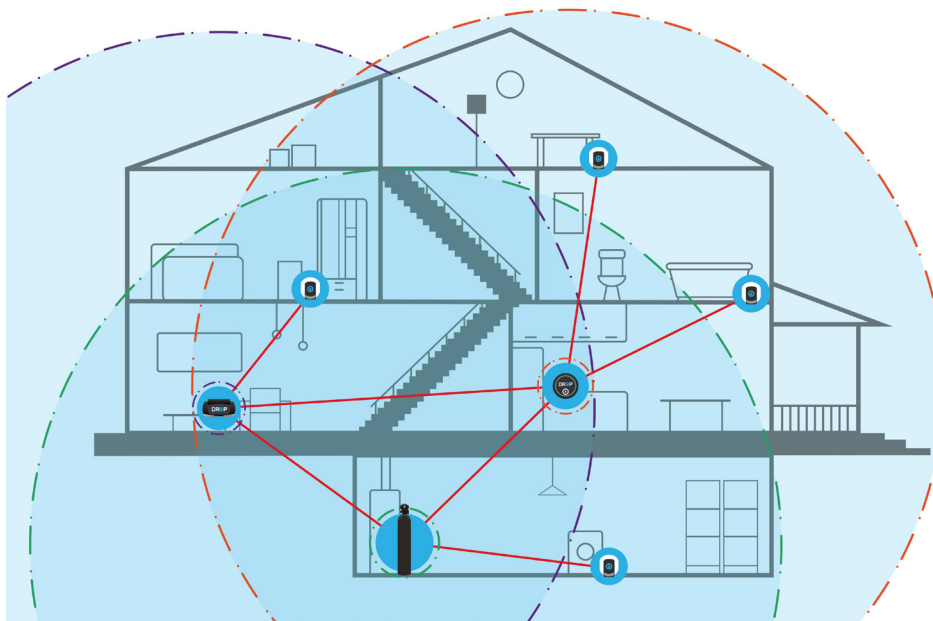
The remote lights will turn orange or green, depending on the remote's current position. If the remote is in service (green lights before the button was pressed), releasing the button while the lights are orange will send the valve to the shutoff position. Likewise, if the remote is in shutoff (orange lights before the button was pressed), releasing the button while the lights are green will send the valve to the service position.



The Remote lights will turn orange. If released during this time frame the remote will be armed for a factory reset and the lights will turn red. If the button is pressed again, once it is red, a factory reset will be performed on the Remote. It is recommended that before performing a factory reset, that you remove the Remote as a device on any DROP system that it might be attached to. This can be done while using a local connection in the App and going to System on the navigation menu on the left, and then the Advanced page (selected at the top). On that page you will see "Manage Device Components". Find the Remote in that list and press the "Remove" button associated with that Remote. Once the Remote is removed then perform the factory reset.



NOTE: *The intensity of the LED lights can be changed in the app.*



As shown above, all DROP devices that plug into 120 volt outlets expand the DROP Link mesh network. When placing the DROP Hub and Remote, keep in mind that installing them in separate areas of the home will expand the network. This is important to consider if you have leak detectors that are located in far extremes of the home. Up to 8 DROP Remotes can be added to a DROP system.



If you wish to connect your system to local WiFi for remote control and notifications, please install the DROP Hub in a location that has a good WiFi signal.

OPERATIONS DROP VALVE - OVERVIEW

Valve Overview

All DROP treatment valves use the same DROP valve control board. They are used to control the various DROP water treatment valves. All DROP treatment valves have one or more motors, have a water meter to monitor flow of treated water and have four lights used to communicate general status of the unit. During normal use the DROP valves direct water through the treatment media. This normal flow state is referred to as the service position. All DROP treatment valves have the capability to shutoff water to the house and to bypass water around the treatment tank. Currently, these are the available types of DROP treatment control valves:

- Softener
- Backwashing Filter
- Backwashing Filter with aeration
- Sidekick filter (advanced backwashing filter with aeration)
- Cartridge filter



DROP Whole House Cartridge Filter Valve.



DROP Sidekick Aeration Filter Valve.



Valve Settings

Treatment valve devices are setup from the factory with some default values that need reviewed and adjusted according to your water quality and personal schedule. If you have not yet connected your Valve device to the system, please see the section “How to Add Your Devices” on page 17.

System Settings

The first settings that need to be reviewed are in the System settings. Choose “System” on the left navigation menu and then “Settings” at the top of the page. The items in the “System Settings” section need to be reviewed; these are Regeneration Time and System Water Source.



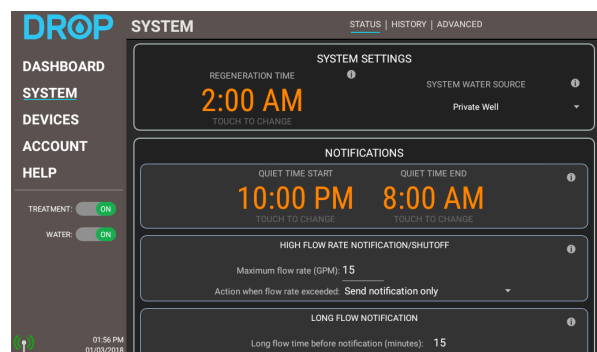
SYSTEM > SETTINGS : SYSTEM SETTINGS

Regeneration Time

The Regeneration Time applies to valve devices that contain treatment media that requires regeneration and/or backwashing. This includes softeners and all various forms of backwashing filters. This setting controls the time of day when the system will begin to regenerate those devices. While a device is in its regeneration cycles any water used in the house or system will not be treated. Therefore, it is important to choose a time of day where water use is least likely. It is also important to understand how long the regeneration of your system will take. For a softener with standard settings it will take approximately 1 hour and 30 minutes. A standard backwashing filter typically takes 30 minutes. Aeration type backwashing filters typically take 45 minutes or longer depending on the air draw cycle time. Some DROP installations will require multiple stages of treatment (for example, a backwashing filter and a softener may be installed). These stages can require regeneration on the same day and would occur one after the other starting at the regeneration time. You should select a regeneration start time that would take these times into consideration along with your water usage schedule.

System Water Source

The system water source setting is used by the DROP system to know how to respond to power outages. It can be set to Private Well or Municipal Supply. If your water supply is not one of these choices, if your water supply is dependent on power to be available (i.e. it is supplied by an electric pump) set it to Private Well, otherwise set it to Municipal Supply.



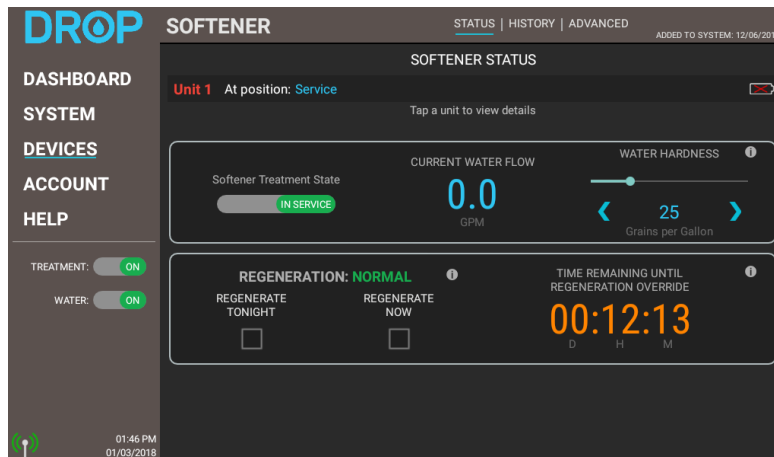
System Settings.

Softener, Water Hardness Setting

If you have a softener as a part of your DROP water management system there is one other setting that must be reviewed, the water hardness setting. To set the water hardness, select “Devices” on the left navigation menu and then select the softener from the devices list. You should then be viewing the Softener, Status page. On this page you will be able to adjust your water hardness setting.

The water hardness is a measurement of mineral content (calcium and magnesium) in the water and is measured in grains per gallon. A water test should have been done on your water to determine the hardness measurement of your water source. Use this measurement as the value for the water hardness setting on your system. This setting impacts the efficiency of your softener as well as the ability of your softener to correctly soften your water, so it is important to set this correctly.

***** Note: If the water contains iron and / or manganese, multiply the total parts per million (ppm) by 4 and then add to the grains per gallon (gpg) of hardness. Use this COMPENSATED HARDNESS level when programming the hardness.



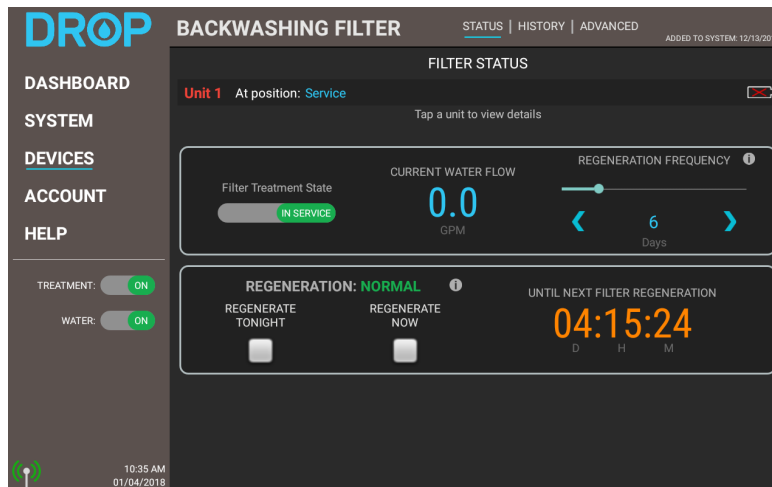
Softener Status page.



Backwashing Filters, Regeneration Frequency

If you have a backwashing filter of any type you need to review the setting for the regeneration frequency. Generally the default setting of 6 days should be adequate for a majority of installations. However, because of the various applications for filtration and treatment media types a water test should have been done on your water to determine the incoming water quality and assess your specific usage requirements.

When that test is done a recommendation will be made as to the equipment you should use and the settings for that equipment. These recommended settings should be used to set your regeneration frequency.



Backwashing Filter Status page.

OPERATIONS DROP VALVE - LIGHTS - NORMAL

DROP Lights - Normal Operation

Your softener and/or filter will normally be in the service position. This is its normal position that treats the incoming water supply. The different treatment valve types have different colors when they are in their service position, so they can easily be identified by the color of their lights. These colors are identified in the list below:



Softener - Green



Filter Valve (Backwashing or Aeration Filter) – Blue



Cartridge Filter – Cyan

While observing your device, you will notice periodic purple flashes on the back lights. These indicate that it is wirelessly communicating to the Hub during that time. Also, when the water meter on your unit senses water flow, the front lights on your device will alternate. The rate of alternation of the lights will give a general idea of the current flow rate. The highest frequency of the lights alternating is determined based on the highest flow seen by your system.

The lights will change color when your device or devices are put into Bypass mode or Water Off. If your water is off, the lights on the valves will be orange. The water can be turned back on using the app or by shortly pressing the button on the Hub. If one of your valves is bypassed, its lights will be bright yellow. Bypassed means that water will not be treated by that device while it is in bypass mode. This may be helpful if you wish to not use treated water in a particular situation, such as watering the lawn.



Image of DROP Valve Lights during Normal Operations.



DROP Lights - During Regeneration

When a treatment valve is in regeneration the lights will change color for each step in the regeneration process. While the valve is sitting in a step of the regeneration process the lights will be slowly fading from side to side (wobble). If the valve is moving to a position the lights will rotate according to the direction of the motor movement to get to that position. The colors for each position are as follows:



Softener

Position	Color
Backwash	Purple
Brine Draw	Light Pink
Rapid Rinse	Light Blue
Brine Fill	Spring Green



Backwashing Filter

Position	Color
Backwash	Purple
Rest	Light Yellow
Rapid Rinse	Light Blue



Aeration Filter

Position	Color
Decompress	Pink
Air Release	Lime
Backwash	Purple
Rest	Light Yellow
Air/Chlorine Draw	Light Pink
Rapid Rinse	Light Blue



OPERATIONS SALT SENSOR



DROP Salt Sensor installed in the brine tank.

Salt Sensor Overview

A DROP Salt Sensor is supplied with every DROP softener system. Once it is connected to your DROP system it will notify you when more salt needs to be added in your brine tank. The height of the trigger point is specifically designed to give you plenty of notice to add more salt before you run out. If your DROP system is connected to DROP Web Services, then you will receive a notification that your system needs salt added. Otherwise, when you connect to your DROP system through your App, you will see the notification on the Dashboard page of the App.

Salt Sensors are ready to use as soon as they are connected as a device to your DROP system. If you have not yet connected your Salt Sensor to the system, please see the section “How to Add Your Devices” on page 17. Once connected, by default they send a notification when low salt is detected.

To add salt, remove the elastic band and make sure paddle is flush against the brine well and you are pouring towards the paddle so that salt doesn’t get between the paddle and the brine well.

Place the elastic band over the top of the transmitter and replace the brine tank lid.



DROP Leak Detector Device.

Leak Detector Overview

The DROP leak detector is designed to detect water leaks and temperature conditions that can cause water leaks. It is powered by 2 AA batteries, which under normal circumstances will last for several years of operation. A leak detector monitors its leak probe input for water.

If water should come in contact with the probes, the leak detector will immediately report the leak to the DROP system. The DROP system will immediately send a notification of the leak (if connected to DROP web services) and will shut the water off at the DROP valves. Shutting the water off can optionally be turned off if your leak detector is not monitoring a system component that is affected by normal source water (such as a condensate pump). The leak detector that sensed the leak will then chirp every 16 seconds and the yellow leak light will flash every 2 seconds.

Leak Detector Placement

In order to reliably detect a water leak, it is very important that the location where the leak detector is placed is well thought out. First, when considering where to place leak detectors think about the locations in your home that use water. Next, think about what locations are most vulnerable to problems. For example; appliances that use water and run unattended, pipes that are more susceptible to freezing, or toilets that are known to overflow or leak.

Also, think about the consequences of water in those areas. Maybe monitoring a water heater in an unfinished basement isn't as important as monitoring a bathroom on the second floor of a home. Prioritize the locations that need protected the most. Also, keep in mind that if more leak detectors are needed, you can add up to 32 leak detectors to your DROP system at any time. Finally when you place the leak detector we recommend that you test where water will tend to accumulate by purposely spilling a small amount of water in that area. Once you observe where water naturally moves to, you should accordingly place your leak detector in that location. Don't forget that you can name your leak detectors according to their location in the app, on the SYSTEM > STATUS page. This will help you locate a problem quickly if a leak does occur. Leak detectors can obviously be placed in the location that you want to detect leaks.

However, there are available accessories for leak detectors to allow more flexibility in their placement and use. A wall mount bracket and a leak detection extension cable are available and can be used to securely mount your leak detector and permanently mount the leak probes exactly where they need to be located.

OPERATIONS LEAK DETECTORS CONT.



DROp Leak Detector Extension Cable and Extension Cable being used.

Leak Detector Operations

Once you have placed the leak detector in the location that you would like, press the “Check/Silence” button. After a few moments, the green okay check mark should light up indicating that it was able to communicate with the Hub. If the red no network light turns on instead, then the leak detector is too far from a powered DROp component on the DROp device network. Any DROp device that is powered with a wall plug power supply can repeat the messages to the Hub.

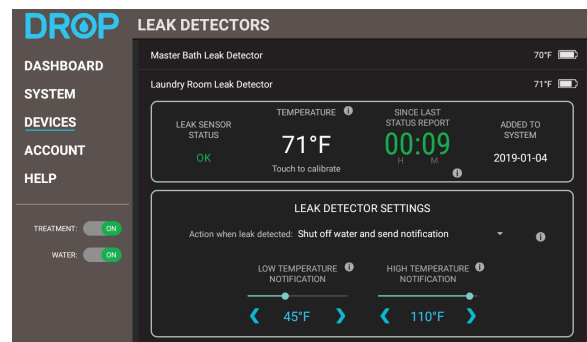
The options for helping a leak detector connect to the Hub are:

1. Move the DROp Hub to a more central location in your home.
2. Move another DROp powered component closer to the leak detector you are trying to connect to.
3. Add a DROp Remote to your network in-between the Hub and the leak detector that you are trying to connect to the system.

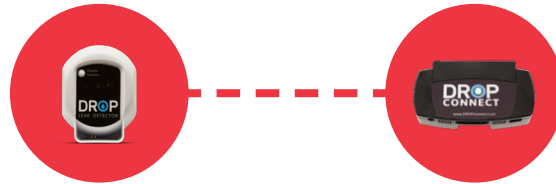
Leak Detector Settings

Leak detectors are ready to use as soon as they are connected as a device to your DROp system. If you have not yet connected your Leak Detectors to the system, please see the section “How to Add Your Devices” on page 14. Once connected, by default they will shut off the water when a leak is detected and send a notification.

By going to the Devices menu on the left side of your app and then choosing Leak Detectors, you can decide for each leak detector if it should shut off the water, or just send a notification. Leak detectors also monitor temperature. High and low temperature set points can be set for each leak detector. If the temperature should surpass the set point a notification will be sent.



Leak Detector Status screen.



Reporting Operation

Leak detectors report to the Hub every 10 minutes under normal circumstances. If the leak detector does not succeed in checking in, it will try again repeatedly until it succeeds. When the leak detector has missed a check in, it will flash its network light until it is able to connect to the Hub again. If it has not succeeded in checking in with the Hub after one hour, the Hub will send a notification that the leak detector has lost connection. If this happens regularly, you may need to help improve the DROPS network as indicated at the end of the section Leak Detector Operations.

If a leak occurs, temperature changes significantly, or temperature surpasses a set point, the leak detector will report to the Hub immediately.

Battery Operation

Leak detectors use 2 AA batteries to operate. The detectors typically sleep most of the time and therefore use very little power. Under normal operating conditions, they will operate for several years on the same set of batteries. When they do get low the low battery light on the leak detector will begin to flash and the leak detector will chirp once a minute (but only outside “Quiet Time” hours). A low battery notification will also be sent by the DROPS system.

Leak Detector Factory Reset

It is recommended that before performing a factory reset, that you remove the leak detector as a device on any DROPS system that it might be attached to. This can be done while using a local connection in the App and going to **SYSTEM > ADVANCED** page. On that page, you will see “Manage Device Components” Find the leak detector in that list and press the “Remove” button associated with that unit. Once it is removed then perform the factory reset.



SYSTEM > ADVANCED : MANAGE DEVICE COMPONENTS

To reset a leak detector and cause it to forget any DROPS network that it has been connected to, press and hold the button while inserting the batteries. Continue to hold the button for 15 seconds. During this time all the lights will be on solid. Once the button has been held for 15 seconds, the lights will begin flashing once per second. At this point the leak detector is armed for reset, release the button and then press it again to cause the leak detector to be reset.

OPERATIONS HOME PROTECTION VALVE

Home Protection Valve Overview

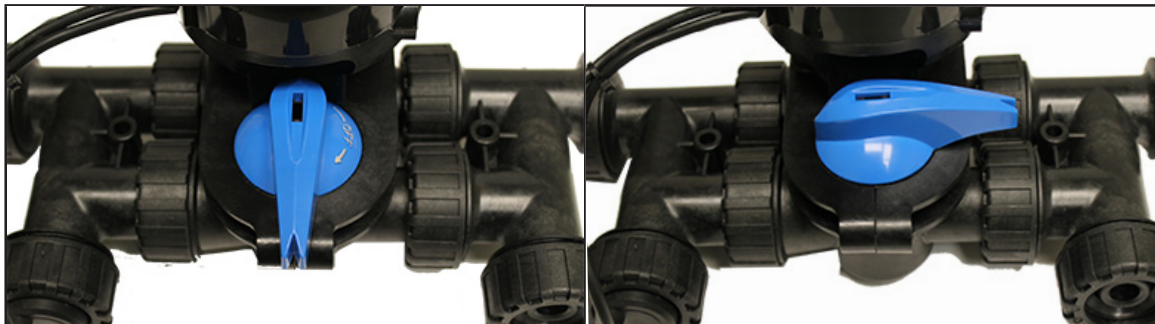
When installed at the water service entrance to your home, the DROP home protection valve can protect your home from water damage caused by leaks, notify you and shut off the water in the event of unusual flow patterns, and test your home for very slow leaks that ordinarily would go unnoticed. The valve features a motorized shutoff valve, a connection for a leak detection cable, a water meter to monitor the flow of water, a temperature sensor, and a pressure transducer to monitor the water pressure in your home.

During normal use, the DROP home protection valve is open and allows normal water flow to the home. When a leak or unusual flow is detected, the valve will close and DROP will send you a notification. (depending on how the DROP system is configured)

If you have not yet connected your Valve device to the system, please see the section “How to Add Your Devices” on page 17.

Manual Bypass

The home protection valve features a manual bypass valve that can be used to restore water service if the shutoff valve fails while in the shutoff position. **It is very important that the manual bypass valve is off as shown below during normal operation.** Otherwise, the shutoff valve will be unable to shut off the water supply when a leak or abnormal flow is detected.



Manual Bypass Off - Normal Operation

Manual Bypass On - Emergency Water Bypass. The valve cannot protect your home in this position.

Lights

The home protection valve will normally be in the service position. This is its normal position that connects the incoming water supply to the household plumbing system. While in service, the lights on the shutoff will be green. When the valve moves to the shutoff position, the lights will change to orange.

While observing the device, you will notice periodic purple flashes. These indicate that it is wirelessly communicating to the DROP Hub during that time. Also, when the water meter on the unit senses water flow, the top lights on the device will alternate. The rate of alternation of the lights will give a general idea of the current flow rate. The highest frequency of the lights alternating is determined based on the highest flow seen by the system.

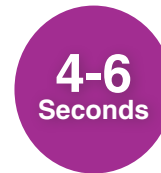


Pushbutton Functions

The home protection valve has a recessed, touch sensitive button that can perform some basic functions. These functions can be accessed by pressing and holding the button. As you hold the pushbutton, the light closest to the button will turn white to confirm the button press, and the top lights will change for the different functions available. The following list explains the functions that are available:



The valve lights will turn orange or green, depending on the valve's current position. If the valve is in service (green lights before the button was pressed), releasing the button while the lights are orange will send the valve to the shutoff position. Likewise, if the valve is in shutoff (orange lights before the button was pressed), releasing the button while the lights are green will send the valve to the service position.



The valve lights will turn purple. Releasing the button while the lights are purple will cause the valve to turn the motor and verify the valve is in the correct position.



The valve lights will turn blue. Releasing the button while the lights are blue will cause the valve to recalibrate the pressure transducer. Note that this option should only be used when the pressure transducer is open to the atmosphere. If it reads more than 5PSI, the instruction to calibrate the transducer will be ignored.



The valve lights will turn orange. If released during this time frame the valve will be armed for a factory reset and the lights will turn red. If the button is pressed again, once it is red, a factory reset will be performed on the valve. It is recommended that before performing a factory reset, that you remove the valve as a device on any DROP system that it might be attached to. This can be done while using a local connection in the App and going to System on the navigation menu on the left, and then the Advanced page (selected at the top). On that page you will see "Manage Device Components". Find the valve in that list and press the "Remove" button associated with that valve. Once the valve is removed then perform the factory reset.

Status and Settings

You can view the status of the home protection valve and adjust settings by starting the DROP Connect app, selecting “Devices” on the left navigation menu and then selecting the shutoff valve from the devices list.

The valve status page includes several settings that can be adjusted:

- Action when leak detected – Normally, the shutoff valve is configured to shut off the water supply when a leak is detected. However, if you are using the sensor cable attached to the shutoff valve to monitor a location unrelated to your water supply (for example, a sump pit or a condensate pan), you can change this setting to only send a notification.
- Low and high temperature notifications – These settings define temperature thresholds that will send a notification when the temperature around the shutoff valve is outside the selected temperature range. The default settings will notify you of low temperatures before your house gets cold enough to freeze and damage water pipes.

Slow Leak Tests

A dripping faucet or a toilet slowly leaking water down the drain will not be apparent on the daily usage graphs and can result in hundreds or thousands of gallons of wasted water each year. The slow leak test uses the pressure sensor in your DROP system to detect very slow leaks during times when you are not using water. The slow leak test is performed by temporarily shutting off the water supply and monitoring the water pressure in your home plumbing system.

When a slow leak test is due, DROP will monitor your water usage and automatically start the test during a time when you are not using any water. DROP will close the water shutoff valve for 10-30 minutes (depending on the test length setting), monitor the system water pressure, and then re-open the valve. Any small, slow leaks will result in a pressure loss in the system, and DROP will notify you if it has discovered a potential leak.

If you happen to use water during a slow leak test, DROP will immediately open the shutoff valve and reschedule the slow leak test for another time. When this happens, it is normal to notice a few seconds of reduced water pressure. DROP will automatically find a test time when water use is unlikely. DROP systems equipped with a home protection valve will display a “Manage Slow Leak Tests” button on the dashboard. Tap this button to manually start a slow leak test and view the results of the previous slow leak test. Also, you can change the slow leak test settings:

- Test Frequency: this controls how often the slow leak test is performed.
- Test Length: this controls the length of each slow leak test.
- Test Failure Threshold: this determines how much pressure loss must be observed before a test failure notification is sent.

For more details on each of these settings, tap the  information icon next to each setting in the app.



