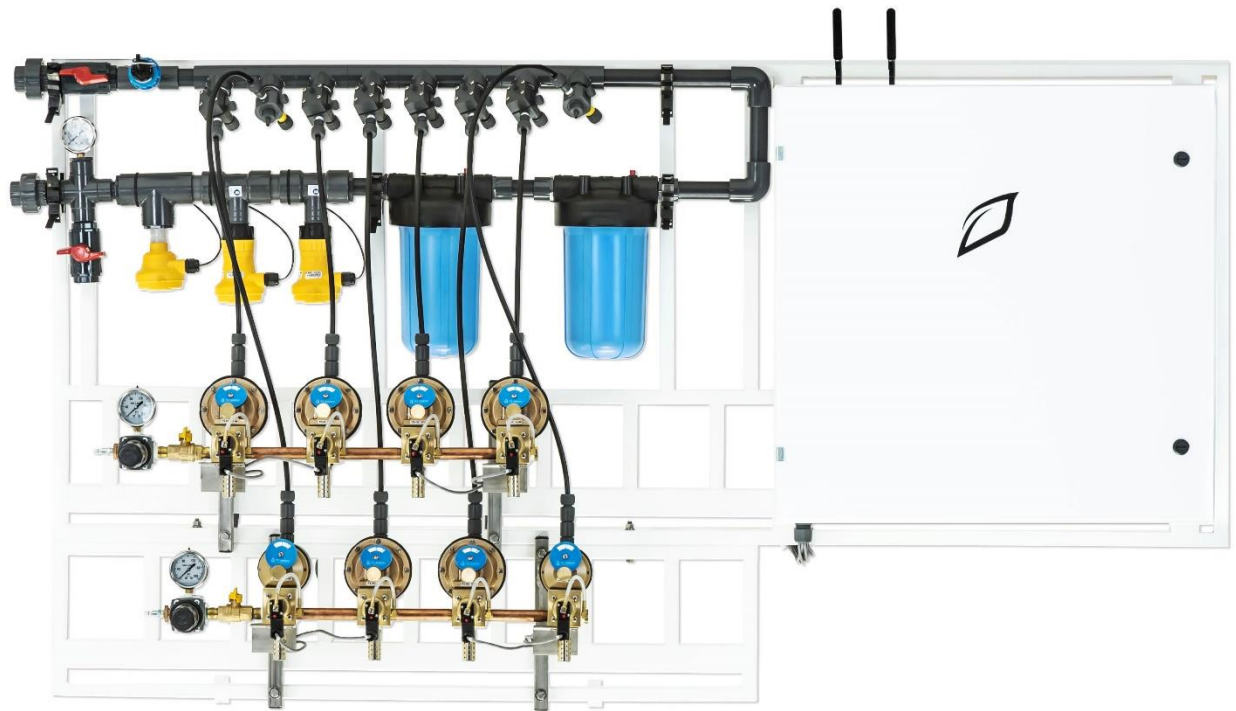




GROWLINK™ CENTRAL FEED SYSTEM

MANUAL





©2021 Growlink

This document contains information that is proprietary Growlink.
Information contained herein may be used only for the benefit of Growlink
Duplication or dissemination for any other purpose is prohibited.

TABLE OF CONTENTS

Introduction1

Automated Plug & Play Fertigation 1

General Instructions 1

Safety Instructions 1

Using Acid/Chemicals 2

On Site Preparation.....3

Electrical Preparation 3

System Requirements..... 3

Equipment & Materials Included 3

Installation4

Unpacking and Placement..... 4

Mounting Equipment..... 4

System Components.....6

Input 6

Flow Meter..... 7

Injectors & Pumps..... 7

Check Valves 8

Maintenance 9

Sensors 9

Fertigation System Description.....11

Dosing Pumps 11

Features 12

How to Prime the Dosing Pumps 14

Control Panel.....14

Create Account/Download Application.....16

Create Account 16

Growlink portal..... 17

Dashboard..... 17

Calibration..... 20

Configure Modules 24

Dosing Recipes 25

Rules..... 26

Manual Task..... 28

Using The Growlink™ Application30

INTRODUCTION

AUTOMATED PLUG & PLAY FERTIGATION

The Growlink™ Fertigation Skid comes pre-assembled and is easy to use. It features an in-line injection system for both direct feeds, and batch tank applications. Our upgraded fertigation system allows you to prepare, stabilize, and deliver user-defined recipes direct to plants or to specific batch tanks while enabling you to automate this process with tank level sensors, moisture sensors and batch schedules. Systems are customized to customer specific flow rates, and feed times.

GENERAL INSTRUCTIONS

- Fertigation System will be shipped pre-assembled.
- Installation is done by the customer provided electricians and plumbers.
- Install on a wall mount by using standard Unistrut. Refer to *Mounting Equipment* section.
- It can take up to two to three technicians to lift the fertigation system from the palette and to hang on the wall.
- Refer to your supervisor if problems occur during installation procedure.
- Do not apply force or pressure on components during the installation procedure.
- Verify that field components work properly.
- Perform manual test to make sure that all elements (valves, pumps, filters, sensors, etc.) function properly.

Electricity

- Conduit is run directly into the side or bottom of the panel to bring in the power directly to the electrical connections.
- The Growlink™ CFS skid requires a 120V 20A dedicated circuit.

SAFETY INSTRUCTIONS

- All safety regulations must be applied.
- Electrical installation must be performed by a licensed electrician only.
- The electrical installation must comply with the local safety standards and regulations.
- Protection provided by the equipment can be impaired if the equipment is used in a manner other than that specified by the manufacturer.



WARNING

In agricultural environment – always wear protective footwear.

USING ACID/CHEMICALS**ACID HAZARD**

When using acid, always observe the acid manufacturer's safety instructions!

**CAUTION**

Always use protective equipment, gloves, and goggles when handling fertilizers, acid, and other chemicals!

**ATTENTION**

When dosing acid, respect the concentration of the acid used*. Refer to *Table 1 - Dosing Acid*.

**WARNING**

Exceeding the recommended acid concentrations will damage the dosing channels.

**WARNING**

Substances such as chemicals for pest/disease control might be corrosive and damage the Growlink™ fertigation system. When using any substance other than fertilizers or acids, always observe the manufacturer's instructions for corrosivity. In case of any doubt, consult your Growlink™ representative.

ON SITE PREPARATION

ELECTRICAL PREPARATION



CAUTION

Only licensed electricians are permitted to perform electrical installations.



ATTENTION

Make sure the electrical supply capacity is in accordance with the electrical characteristics of the Growlink™ CFS system.

Have a licensed electrician check that electricity is being supplied to the Growlink™ fertigation system and that all the electrical components are properly connected. Refer to the *Control Panel* section.

System Requirements

System Requirements include:

- Electrical - 120VAC 20Amp service
- Flow Rate specified per customer site.
- Water pressure 35-65 PSI

EQUIPMENT & MATERIALS INCLUDED

- Growlink™ Fertigation System (pre-assembled)
 - Components include:
 - In-line Injector ports
 - High Resolution Flow Meter
 - Mixing Chambers
 - Manual Ball Valves
 - Sensors (pH x 2, TDS)
 - Dosing Pumps
- Antennas – Wi-Fi and local RF
- Growlink™ CFS System Installation Manual
- pH Probe Data Sheet
- Signet EC Probe Data Sheet
- HE Anderson pneumatic driven injection pumps
- Growlink™ Core Controller
- Nutrient Expansion Board
- 16-Channel Expansion Board

INSTALLATION

UNPACKING AND PLACEMENT





Place the Growlink™ CFS system close to the irrigation system install area and carefully open the packaging.

Screw the antennas onto the threaded SMA cable ends on top of the Growlink™ panel

MOUNTING EQUIPMENT

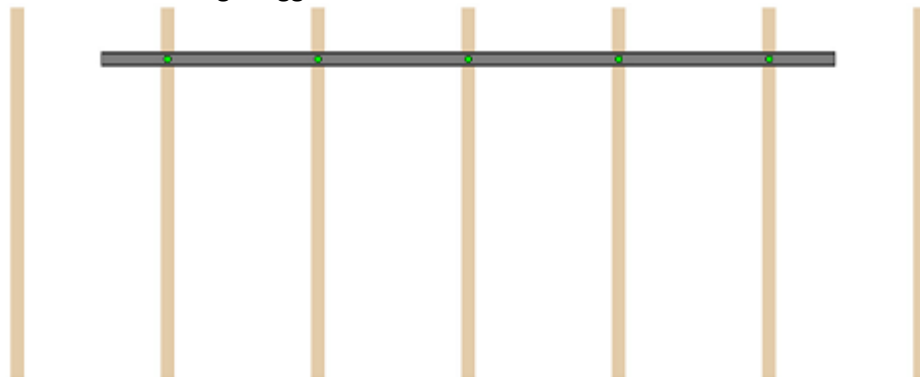
Fertigation Skid Mounting Instructions

Parts Used In Installation:

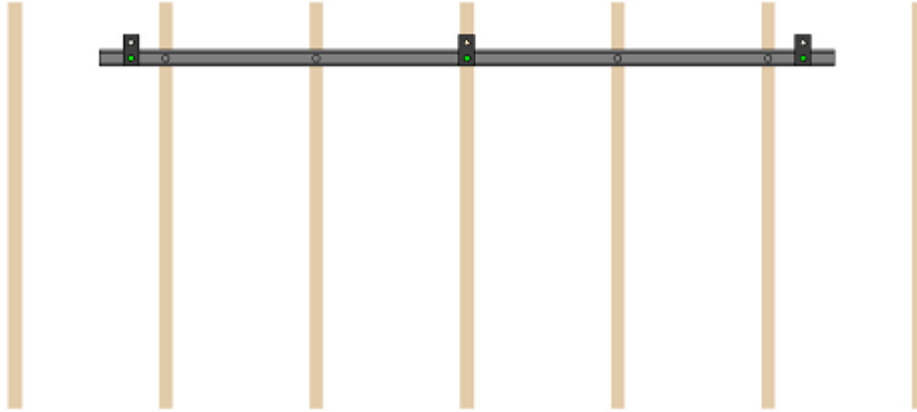
	2x Unistrut Bars (6.5' long)	Home Depot: SKU #: 235918
	3x Strut Channel Brackets	McMaster-Carr: Item #: 33125T435
	3x Nylon Strut Cone Nuts (1/2" thread)	Home Depot: SKU #: 1002151010
	3x Bolts (1/2" thread)	Home Depot: SKU #: 356297

Directions:

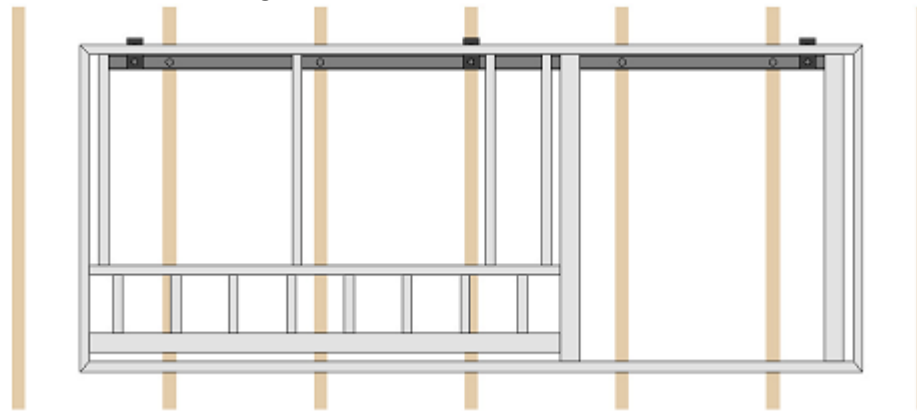
1. The CFS mounting height recommendation is 2' to 4' off the ground. Using a piece of standard Unistrut (1 5/8" x 1 5/8"), cut it to a length of 6.5 feet long. This length matches the fertigation skid's top wall support bar. Identify the vertical mounting position on the wall for the Unistrut, keeping in mind that the fertigation skid's upper support bar is going to be resting on top of this. You also need to make sure the Unistrut is mounted to at least 4x wall studs – the more the better. Use 3/8" lag bolts (3.5" long minimum), along with fender washers to secure the Unistrut to wood studs. If mounting to metal studs, you will need to use large toggle bolts instead.



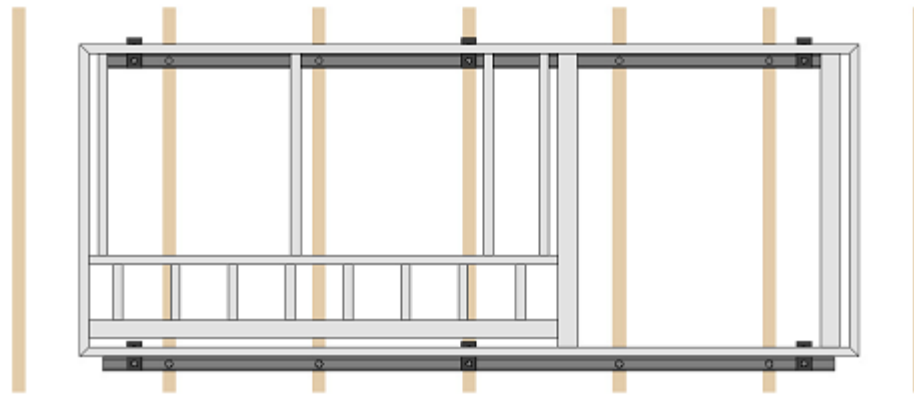
2. Bolt a minimum of 3x strut channel brackets to the Unistrut using ½” bolts and ½” nylon strut cone nuts:



3. With the help of several people, lift the fertigation skid so the upper wall mount bar goes up and over the brackets, and rests on top of the Unistrut. Once you are happy with the horizontal position of the frame, you can then slide the outside brackets outwards until touching the sides of the support frame and re-tighten. This will prevent horizontal movement of the fertigation skid.



4. For additional support, mount a 2nd Unistrut under the fertigation skids bottom wall support bar, in the same way as described above:



CAUTION

Failure to provide adequate structural strength for this mounting system can result in serious personal injury or damage to equipment. It is the installer’s responsibility to make sure the structure to which this mounting system is attached can support five times the combined weight of equipment.

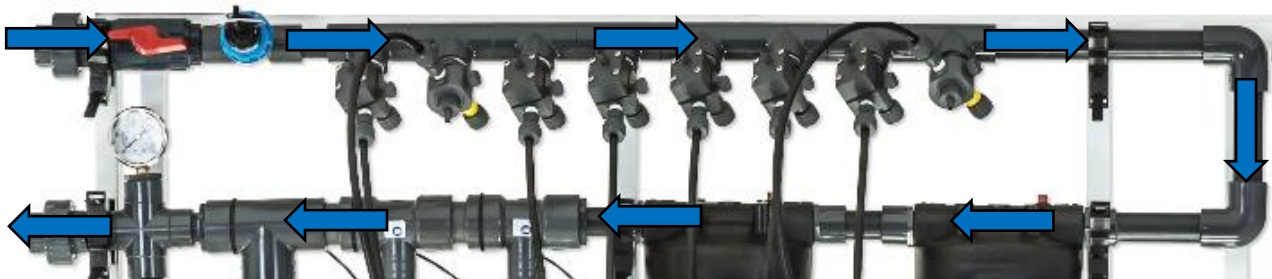
Using two or three technicians, lift the frame from the pallet and place on the support brackets anchored to the wall.

Weight

The weight of the Growlink feed system varies according selected pump system. The total weight of the complete system is approximately 500-700 LBS depending on how many injectors are in place. This does not include water weight.

FERTIGATION SYSTEM OPERATION

INPUT



Fresh water is brought into the top of the 1”-1.5” inlet.

Make certain the union seal is properly secure from the water supply, to prevent leaks.

FLOW METER



A flow meter measures the amount of flow.

Growlink™ uses the Signet 2536 Rotor-X model.

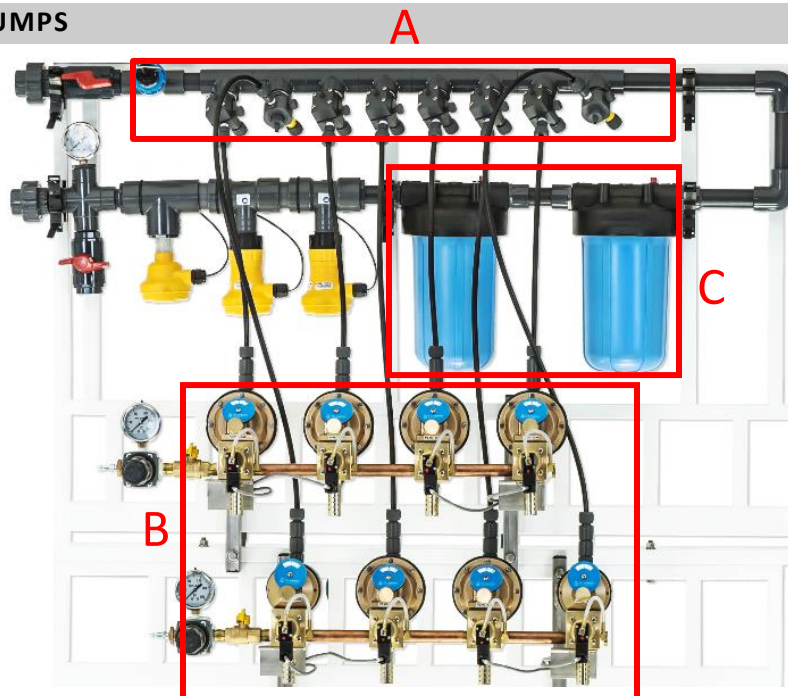
Based on the manufacturer, the flow meter requires a straight run of 30" of pipe (no elbows) installed directly before the flow meter.



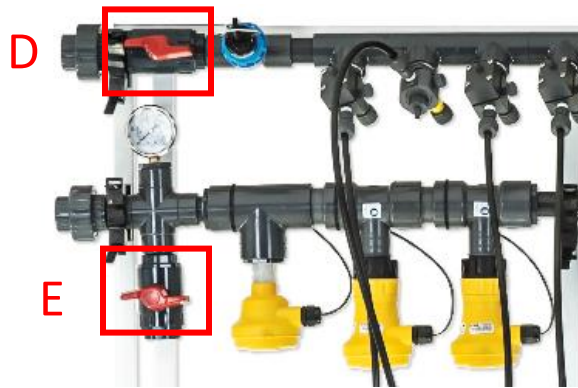
CAUTION

EC and pH sensors must never be exposed to pressure greater than 6 bars (87PSI).

INJECTORS & PUMPS

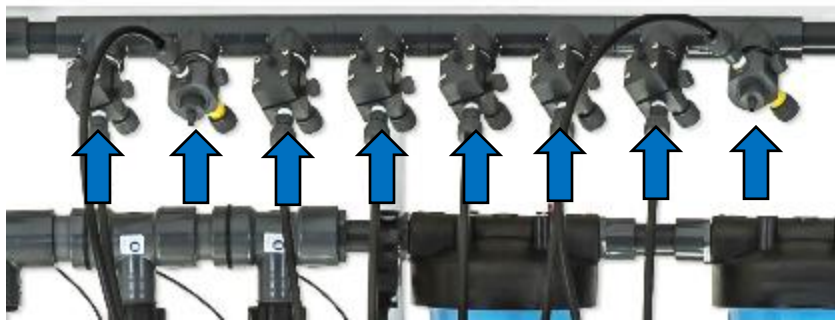


A	Injectors	This is where each of the nutrients are injected inline.
B	Pumps	Refer to <i>CFS System Description – Dosing Pumps</i> section.
C	Mixing Chambers	As the water flows through, it goes around and passes through the mixing chambers to homogenize the various nutrients.



D	Shut Off Valve	Used to shut off water to Fertigation skid during maintenance, service, and/or calibration of probes when needed
E	Drain Valve	Used to drain the water to take out, service and calibrate the sensors when needed.

CHECK VALVES



Check valves are used to ensure pressurized water does not flow back into the pumps.

The suction line connected to the bottom of the dosing pumps goes into the stock nutrient tanks.



WARNING

Increasing the water pressure is not an automatic solution for all irrigation coverage problems. Your irrigation system must also be able to handle the increased water pressure and flow as well. Creating too much water pressure can do serious and expensive damage to an irrigation system.

The recommended water pressure is under 35-65 PSI.

MAINTENANCE

To prevent failures and extend the life cycle of the Growlink™ fertigation system, regular maintenance must be carried out by the user, such as flushing the system with fresh water, periodic rinsing of chambers and calibration of the EC and PH sensors. Calibrating the pH probe every 3-6 months and the EC probe every year are the suggested regular maintenance intervals.



CAUTION

Make sure to shut off the water valves before removing the Mixing Chambers. When removing, be mindful of the water stored inside the chambers.

Pump Maintenance

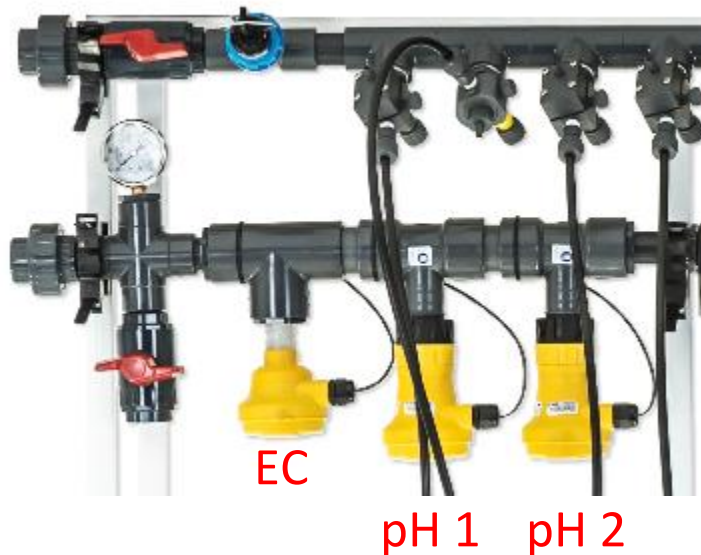
Normally the pumps should require little maintenance. This, however, depends on the quality and cleanliness of the chemical being pumped.

- The pumper should be inspected at regular intervals for proper operation and leaks.
- Check the suction and discharge valves for cleanliness, chemical attack, and scale build-up.
- At some time the elastomer parts(O-rings and diaphragms) will have to be replaced.
- Periodically shut off the water and remove and inspect the injection point fitting. Reaction of the chemical being injected with the chemicals already in the water can sometimes cause scale to form. This can restrict or even completely stop chemical flow. If scale is found, clean it off thoroughly and establish a regular schedule for checking the fittings.
- Check to be sure all pumpers are properly primed after completing these checks and putting the feeder back into service.

SENSORS

The Growlink™ CFS uses the Signet 2850 Conductivity/Resistivity Sensor & the Signet 2751 pH/ORP Smart Sensor

- EC (total dissolve solvent) sensors measure the concentration of nutrients.
- Two pH sensors indicate the pH level of the water. Two pH probes are for redundancy, as pH probes can fail, and it is important to have the correct pH water going to the plants.



Safety Information

1. Depressurize and vent system prior to installation or removal.
2. Confirm chemical compatibility before use.
3. Do not exceed maximum temperature/pressure specifications. Refer to the *Signet EC Probe Data Sheet*.
4. Wear safety goggles or face shield during installation/service.
5. Do not alter product construction.
6. When using chemicals or solvents, care should be taken and appropriate eye, face, hand, body, and/or respiratory protection should be used.

Operating Range

The 2850 is capable of measuring conductivity and resistivity values between 0-10 EC. Refer to the *Signet EC Probe Data Sheet* for the Operating Range Chart and the Field Selectable Ranges.

Specifications

For General, Materials, Electrical, Max. Temperature/Pressure Rating, Shipping Weight, and Standards and Approvals specifications, refer to *Signet EC Probe Data Sheet*.

Maintenance

The 2850 requires periodic maintenance.

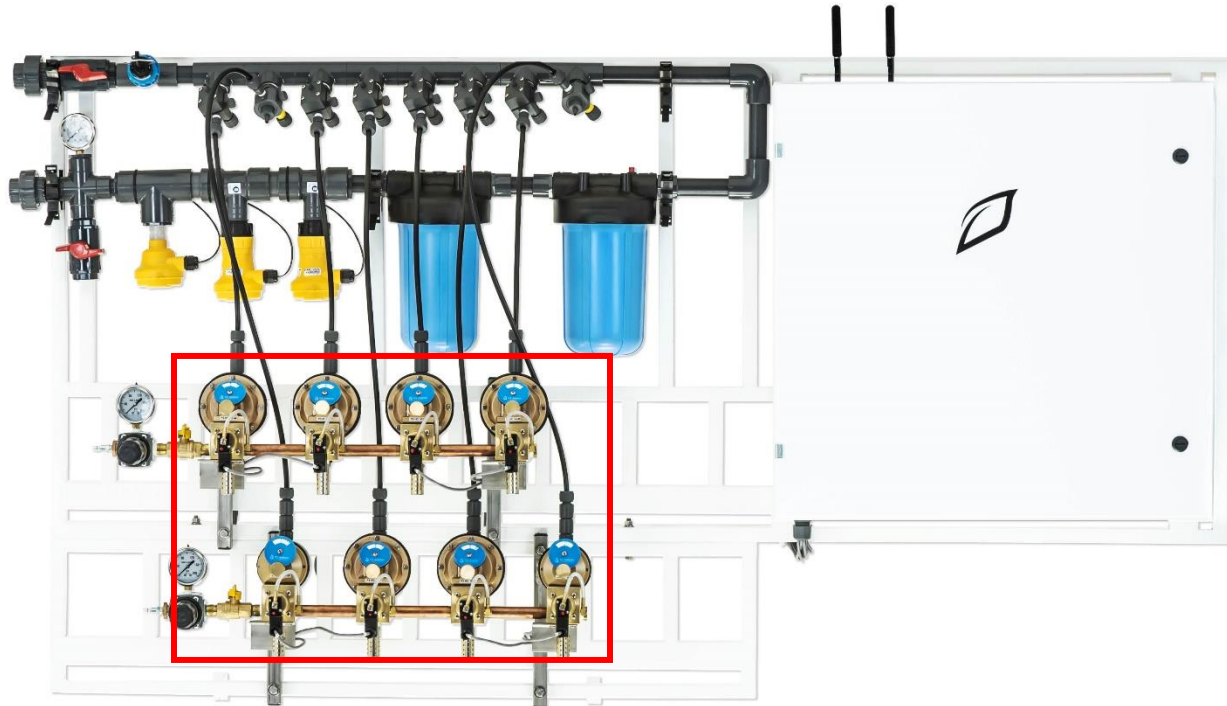
- Coatings on the electrode may cause slow response or drift.
- Clean surfaces with a mild detergent and a non-abrasive brush or cotton swab.

FERTIGATION SYSTEM DESCRIPTION

DOSING PUMPS

A,P & H are the range of innovative skid mounted pneumatic driven dosing pumps that HE Anderson has designed following many years of experience working with its customers worldwide. These multifunctional pneumatic driven dosing pumps maintain outstanding precision, reliability, versatility, and performance.

- The dosing pumps are pre-wired.
- Acid or nutrients are pumped into the water from the dosing pumps. Generally, the first set of dosing pumps are acid, which control the pH up or pH down.
- System pressure, line pressure at 40-65 PSI is recommended.





AIR COMPRESSOR

H.E Anderson pumpers are pneumatically powered. This requires a customer provided air compressor.

Recommended model: Ingersoll Rand Ingersoll Rand 48671770 SS5L5 High Capacity Air Compressor.

Note: Make sure to check oil/lubricant levels of compressor before, and during operation.

Specification	Description
Brand	Ingersoll Rand – SS5L5, 5 HP, 60 Gal.
Product Weight	310 lb.
Product Length	20 in.
Air Outlet Size	½ in.
CFM @ 90 PSI	18.1
Compressor Type	Oil Lubricated
Drain System	Manual
Duty Cycle	100%
Grade	Commercial
Lubrication Type	Oil
Max. Operating Pressure	135 PSI
Phase	Single
Power Type	Electric
Product Height	71 in.
Product Width	30 in.
Running HP	5 HP
Tank Capacity	60 Gal.
Voltage	230v
Oil Type	Ingersoll Rand OEM All Season Select Synthetic

PUMP FEATURES

A brass casing contains 4 different models with flow rates ranging from 1.9mL to 25.4mL per stroke.



Output

The output for the four dosing pump models are as follows:

Model	Max. Stroke Capacity	Max. Stroke Rate	Output GPD	Output GPH
A3	3mL Per Stroke	40 str/min.	45.6	1.9
P1	10mL Per Stroke	40 str/min.	152	6.3
P2	20mL Per Stroke	40 str/min.	304	12.7
H4	40mL Per Stroke	40 str/min.	609	25.4

Standard and High Capacity Operating Pressure

30 to 125 psi

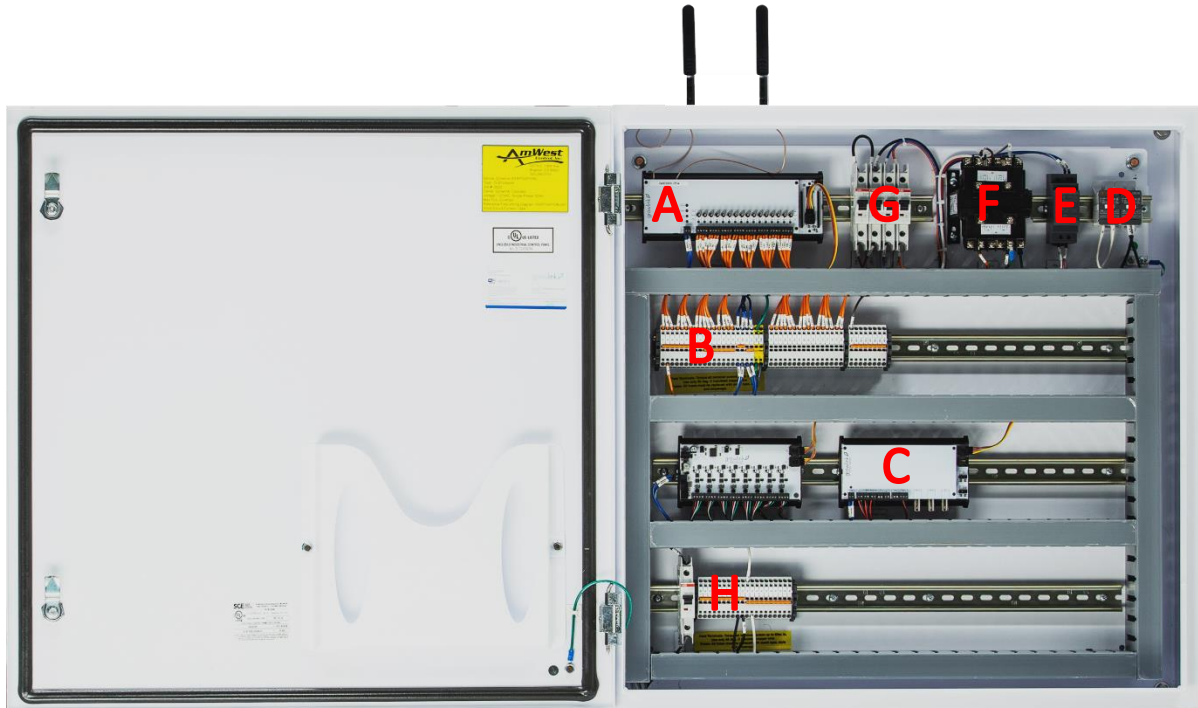
HOW TO PRIME THE DOSING PUMPS

Suggested priming steps based for H.E. Anderson pumps:

1. Make sure that each pump dial is set to 10 on the dial scale while priming.
2. Connect suction line and weighted strainer to pump inlet.
3. Place suction strainer at the bottom of a container of the desired stock solution.
4. Connect the provided bleeder hose to the bleeder valve barb on diaphragm.
5. Open bleeder valve fully.
6. Using the Growlink™ App, turn the desired pump on at 100% under the Devices list.
7. Close bleeder valve when liquid starts to pump out of it. **Note:** If the stock solution is not rising past a certain point in the suction line while priming, use a syringe plunger to siphon the attached bleeder line-until solution starts to pump out of bleeder valve.
8. Once the outlet line and injector fitting have filled completely with solution and is pumping into the water line, turn the pump back to the Auto setting in the App which will turn it off.

CONTROL PANEL

The control panel consists of the main controller, the Growlink™ Core. The pumps and sensors are pre-wired into the expansion board. Note: All Growlink™ panels are custom built. There may be variation in your panel configuration.



A	Growlink™ Core	16 Channels are used to activate injection pumps/16 Channel outputs
B	Zones	16 Zone Valves (16 Channels terminate here) See <i>Terminals</i> below.
C	Nutrient Expansion Module	The following connect to the Nutrient Expansion Module: <ul style="list-style-type: none"> • Two pH sensors • EC sensors • Flow meter • Temperature probe • 5 Analog inputs – used for level sensors for the tanks
D	Main Power Supply	Main power brought into the main controller
E	12 Volt Power Supply	Powers all the circuit boards
F	24 Volt Transformer	Provides 24VAC to all outputs
G	Circuit Breakers	Used to cut the power, 4 circuit breakers used for: From left to right <ul style="list-style-type: none"> • 1A Breaker for 120VAC going in to Mean Well DC power supply • 2A Breaker for 120VAC going to HPS transformer • 8A Breaker for 12VDC coming from Mean Well power supply to control boards • 2A Breaker for 24VAC coming from transformer to switches 1-16 on 16-Channel Expansion
H	Power Distribution	Distributes power to the pumps/Irrigation zones. A circuit breaker is located on the power distribution and can be used to shut off power to the pumps. (May not be present with H.E. Anderson Models)

Terminals

The main terminals are labeled 17-O through 32-O and are used to:

- Terminate signal wires for irrigation valves.
- Terminate the other wire for the solenoid valves (NEU terminals)

Growlink™ supports only 24VAC solenoid valve control in the standard panel. The 24VAC is the industry standard control voltage. There may be an occasion to have a valve with a voltage other than 24VAC, in that case it is recommended to specify the alternate voltage during the design process, to custom build the panel. **Note:** The use of voltage other than 24VAC is not common.

Watch Dog

The watch dog is built into the controller. The purpose of the watchdog functionality is to add an additional level of safety to the system. This includes the ability for the system to recover from a glitch (software, hardware, building power anomaly, etc.), and to have a backup/failsafe if the system is unable to recover.

As soon as the system is up and running and all testing has been completed, it is time to turn the watchdog functionality on. The watchdog functionality is configured on the Core circuit board with 1 pin jumper. This area is in the lower right corner of the circuit board. By default, the watchdog functionality is turned off. When bringing the system online, place the Watchdog jumper pin in the On position.

CREATE ACCOUNT/DOWNLOAD APPLICATION

CREATE ACCOUNT

The next step to installing the Growlink™ CFS is to create an account and connect it to the main controller to the network via WiFi or adapter for Ethernet.

To Create an Account:

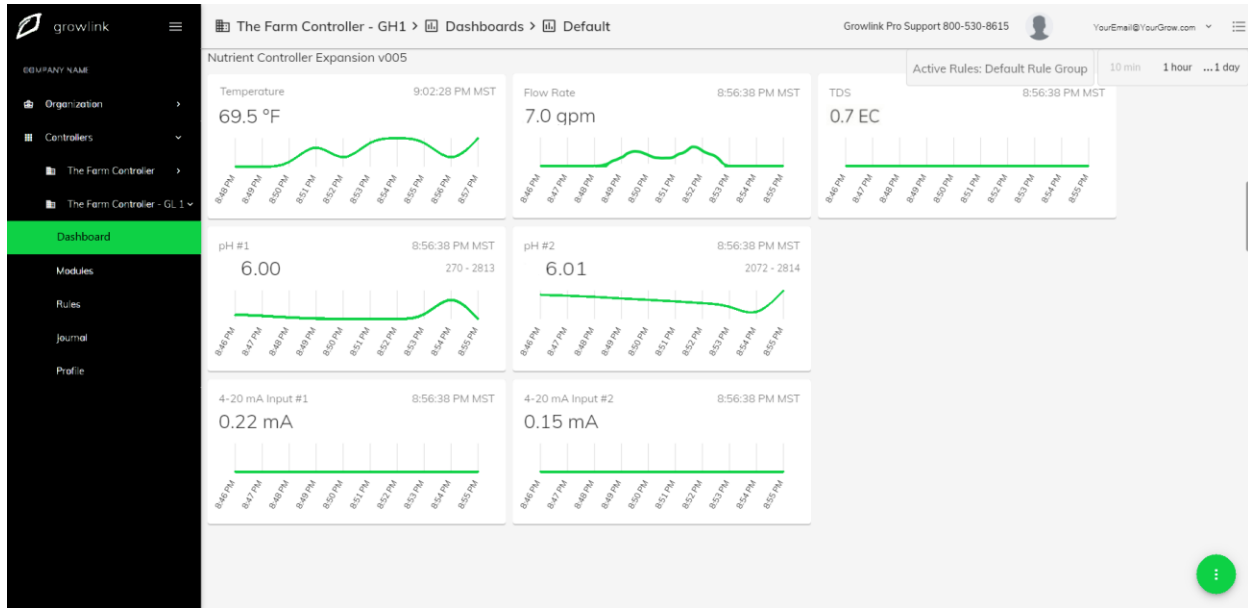
1. Navigate to the **Growlink Portal** by typing *portal.growlink.com/login*.
2. Enter your **Email** and **Password** and click **LOGIN**.
3. Click the **Email Username** on the top right corner.
The users associated to the account displays.
4. Click Create.
A pop-up window displays.
5. Complete all required fields and set a password.
6. A user can be assigned administrative access, where they can make changes to controllers and rules, or a user can be assigned "Read-Only" access, where they can monitor controllers but not interact with controllers.

GROWLINK PORTAL

Logging In

1. Navigate to the **Growlink Portal** by typing *portal.growlink.com/login*.
2. Enter your **Email** and **Password** and click **LOGIN**.

The *Organization Dashboard* displays. Here you can view the Sensor Readings.

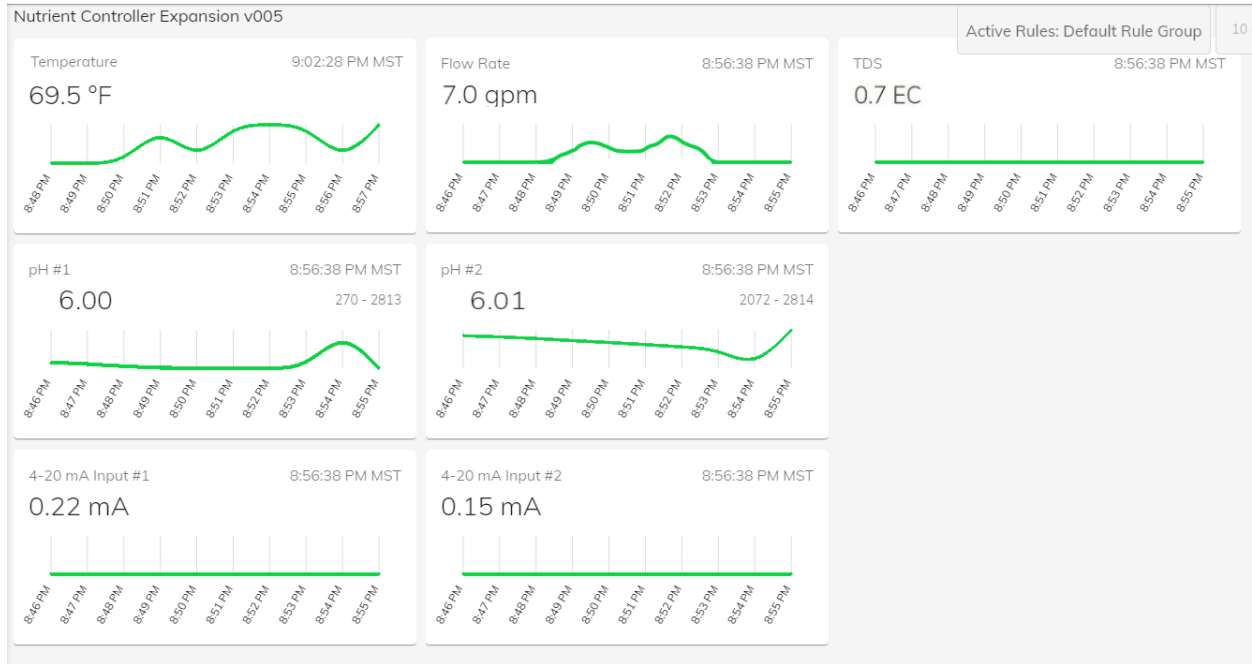


DASHBOARD

All dashboards are setup during commissioning with the same standard configuration. The Dashboard displays detailed information about the Sensors, Devices and Manual Tasks.

Sensors

The Nutrient Controller includes pH, conductivity, reservoir temperature and reservoir level sensors.

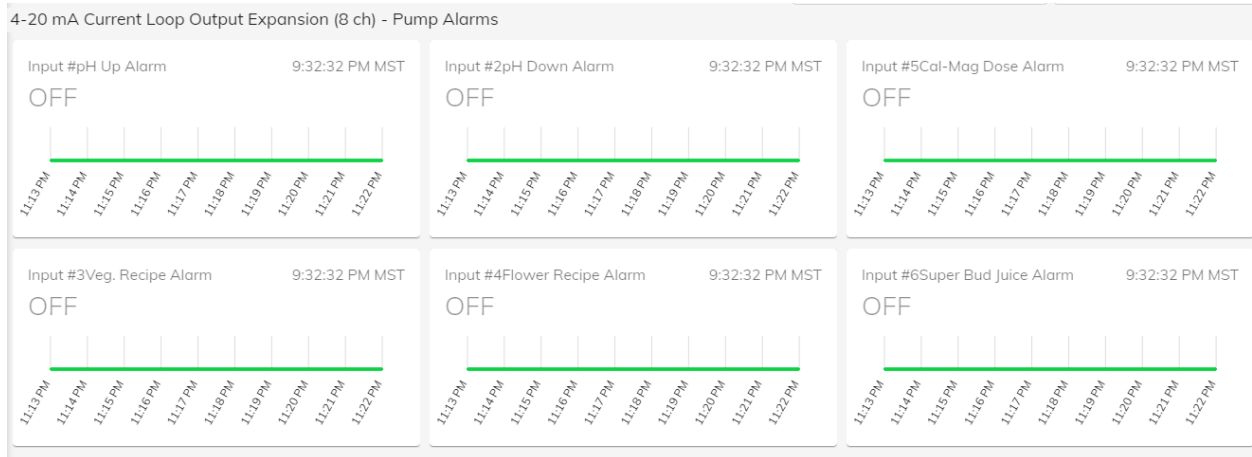


The Nutrient Controller Expansion

- **Temperature**
- **Flow Rate**
- **TDS**
- **pH01 & pH02**
- **4-20 mA Input**

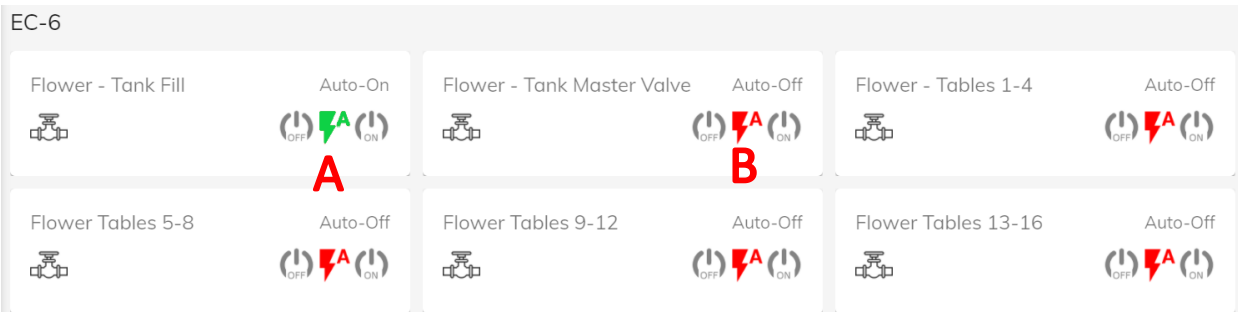
4-20 mA Current Loop Output Expansion

This section displays the pump alarm information.



Devices

The Devices section on the Dashboard shows the Device type (rule stated) information. A device is an external device that is controlled by a Growlink Controller. Devices connect onboard I/O ports (depending on your model). Examples of devices are fans, lights, pumps, and humidifiers.



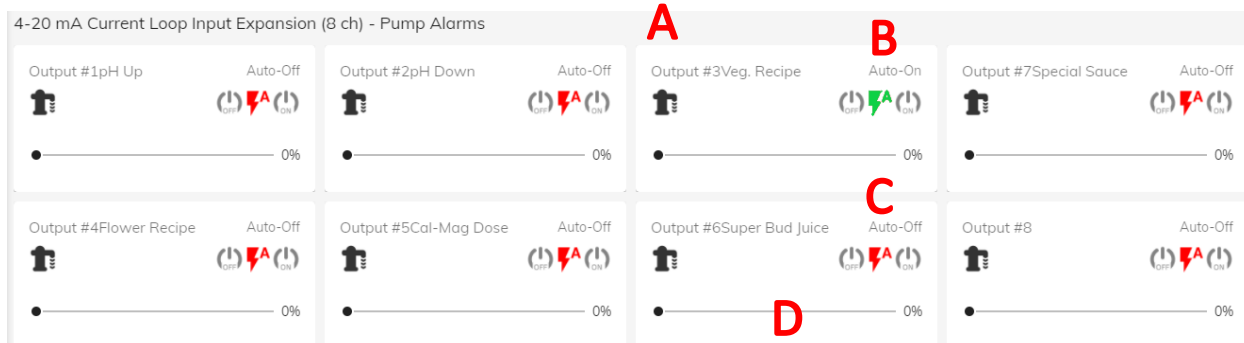
A	Auto-On	Valve is open - Click the OFF icon to force off.
B	Auto-Off	Valve is closed - Click the ON icon to force on.

Note: Devices will NOT follow rules when forced On, or Off.

Always have devices in the Auto position to follow rules and schedules.

4-20 mA Current Loop Output Expansion

The Output Expansion on the Dashboard displays the Dosing information.

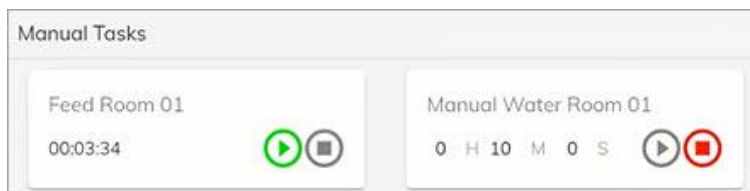


A	Dosing	Type of dosing based on the rule, i.e., Grow NPK.
B	Auto-On	Active - The rule is instructing the dosing to turn on. Click the OFF icon to force off.
C	Auto-Off	Not active. The rule is instructing the dosing to turn off. Click the ON icon to force on.

D	Flow Rate Percentage	Pump is running at a certain throttle, i.e., 20%
---	----------------------	--

Manual Tasks

The Dashboard allows the manual tasks that are set to play. Press the **Stop** button to stop the manual task.



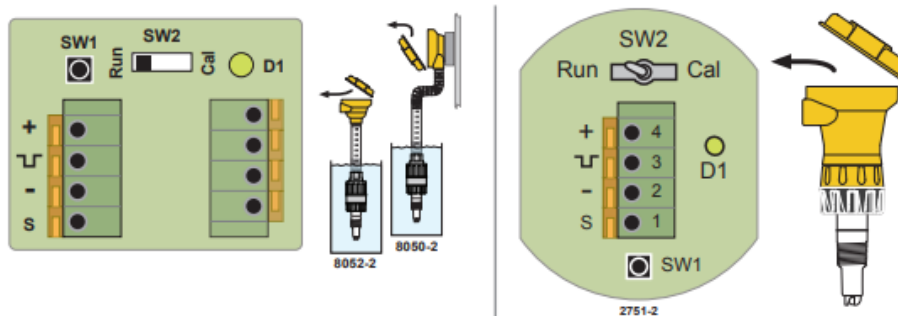
CALIBRATION

How to Calibrate Your pH Sensor

All 2751 pH/ORP Smart Sensor Electronics are factory-calibrated for maximum out-of-the-box accuracy. Periodic recalibration is required to compensate for electrode aging.

The optional EasyCal feature allows calibration to be performed local at the sensor.

- SW1 EasyCal button
- SW2 RUN/CALIBRATE switch for (S³L) system
- D1 EasyCal Indicator (green LED)



Required Equipment:

- 2751-2 with built-in EasyCal or Any 2751 with 8050-2 or 8052-2 junction box with EasyCal
- Standard pH buffers (pH 4.01, 7.00 or 10.00)
- Quinhydrone saturated standard pH buffers (pH 4.01, or pH 7.00) or Light's Solution, 469 mV

EasyCal Procedure:

The first step (Reset) is recommended each time an electrode is replaced but is NOT necessary upon initial installation or periodic calibration.

In fact, for periodic calibration it is best for the electrode/sensor assembly to remain intact to minimize the possibility of moisture or other contamination entering the electrical interconnection area. The electrode/sensor connection must remain dry and clean at all times.

1. **Only If replacing electrode:** Reset the 2751 pH/ORP Smart Sensor Electronics to factory calibration: With no electrode connected to the Sensor, press and hold SW1 until the LED (D1) comes on steady then goes off again (approx. 10 seconds). When the LED goes off, one blink will occur. This indicates the reset was successful. Release SW1; reset is complete.

2. Connect an electrode to the 2751 pH/ORP Smart Sensor Electronics.

3. Place the electrode/sensor assembly into a calibration solution as follows: (If the electrode is “healthy”, then the 2751 will automatically recognize the solution. The order in which the solutions are used during the calibration procedure is of no consequence). The 2751 ORP EasyCal is a single point calibration.

- For pH calibration, use any two of these international standards: pH 4.01, 7.00 or 10.00 buffer solutions. (Signet part number 3-0700.390 contains one capsule of each value)
- To produce standards for ORP calibration, mix the chemical Quinhydrone into pH 7.00 and 4.01 buffers to saturation (1/8g per 50 ml). The 2751 can also use Light's Solution (469 mV), a commercial ORP calibration solution, for ORP calibration. The 2751 offers a one point ORP calibration, for this reason only a single buffer near your operating point is required for EasyCal.
- Regardless of the size of the container used for calibration, one inch of solution is adequate to completely submerge the tip of the electrode.
- **Allow at least 30 seconds for the electrode response to stabilize before calibration.**

4. Press and hold SW1 for approximately 8 to 10 seconds. During this time, the LED (D1) will come on steady then go back off. Release SW1 (If the LED blinks several times rapidly, the calibration was not successful. See the troubleshooting section in included GF/Signet manual)

5. Remove the electrode/sensor assembly from the first calibration solution, rinse the electrode with clean water, and place it in the second solution.

NOTE: If using the 2751 Smart Sensor Electronics, only a single point is used to calibrate the 2751 and ORP electrode.

- **Allow at least 30 seconds for the electrode response to stabilize before calibration.**

6. Press and hold SW1 for approximately 8 to 10 seconds. During this time, the LED will come on steady then go back off. Release SW1. (If the LED blinks several times rapidly, the calibration was not successful. See the troubleshooting section in the included GF/Signet manual.)

Calibration is complete. Return the system to service.

How to calibrate Electrical Conductivity (EC/TDS)

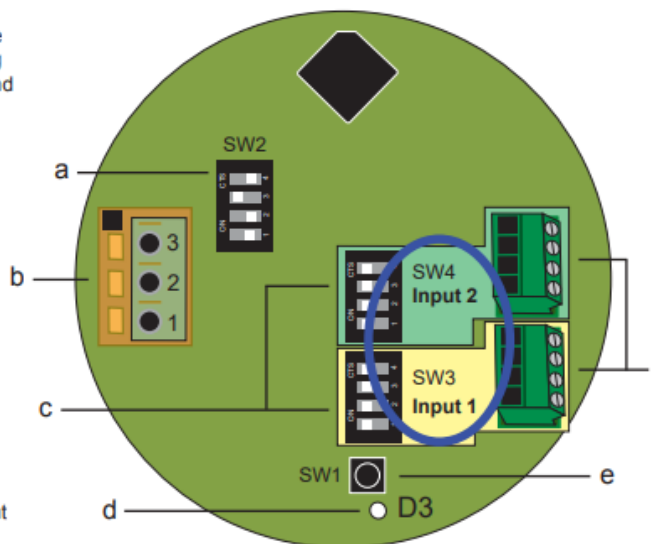
- All 2850 Conductivity/Resistivity Sensor Electronics are factory calibrated for maximum out-of-the-box accuracy.
- The EasyCal feature allows calibration to be performed at the sensor.

The 2839-2842 Conductivity sensors come with a certificate of calibration. This certificate provides information regarding the actual cell constant and temperature offset as tested and verified according to NIST standards. This information has been programmed into the 2850 electronics as its default factory value. If required, the sensor can be recertified by contacting the GF Signet repair department.

- a. SW2: 4 to 20 mA output range selection switch bank
- b. Power and Output terminal block: 4 to 20 mA or Digital (S²L) Outputs
- c. SW3 and SW4: Electrode Cell Constant selection switch banks
- d. D3: LED indicator
- e. SW1: EasyCal Push-button
- f. Input 1 & Input 2: Conductivity Electrode connections

NOTE:

When the electrode is changed from its original factory provided electrode or the application requires a cell constant change, reset SW3 or SW4 switches (see page 6). Then perform a wet calibration with calibration standards.



EasyCal is a single-point calibration system. During this procedure, if the measured value is within $\pm 10\%$ of any of the test values listed below, the 2850 will automatically recognize the test value and calibrate the output to that value.

NOTE: The first step (Reset) is recommended each time an electrode is replaced, but is NOT necessary upon initial installation or periodic calibration.

1. **Only If replacing probe: Reset** the 2850 Sensor to factory calibration: Set all switches on SW3 (and SW4 for Dual Input) to OPEN. Apply power, wait at least 3 seconds, then press and hold SW1 until the LED (D3) comes on steady then goes off again (approx. 10 seconds). When the LED goes off, release SW1; reset is complete. Reset SW3 and SW4 to the proper settings.
2. **Place** the electrode/sensor assembly into the conductivity test solution appropriate to your operating range. Shake the electrode to dislodge any air bubbles visible on the surface of the electrode.

- 146.93 μ S, 1408.8 μ S, 12856 μ S (per ASTM D1125-95)
- 10 μ S, 100 μ S, 200 μ S, 500 μ S, 1000 μ S, 5000 μ S, 10,000 μ S, 50,000 μ S, 100,000 μ S.

Allow at least 2 minutes for the electrode response to stabilize.

3. **Press** and hold SW1 for approximately 8 to 10 seconds. During this time, the LED will come on steady then go back off. (If the LED blinks several times rapidly, the calibration was not successful. See the troubleshooting section).



Calibration is complete. Return the system to service. **Temperature**


- The temperature output of the electrode must be calibrated only once. When a new electrode is installed, it does not need to be repeated.
- Because the temperature measurement has a significant influence on the electrochemical measurement, the temperature output in new pH electrodes should always be calibrated before the pH/mV calibration.

Note: All signet transmitters and controllers incorporate automatic temperature compensation.

Calibrating H.E. Anderson Pumps

1. Make sure the pump is fully primed with the stock solution the pump will be dosing.
2. Measure 1000mL of nutrient solution in a graduated pitcher with graduations at least every 25mL.
 - a. For calibrating pH Up or Down pumps, measure out 200mL of solution in a smaller graduated pitcher. Since these pumps inject much less, a smaller pitcher will provide a more accurate measurement.
3. Place suction line and weighted strainer into pitcher of measured stock solution. Make sure there are no air bubbles in the suction strainer. Tapping the strainer on the side of the pitcher will usually release any air bubbles.
4. Create a **Manual Task**(see Manual Task on pg. 29) called “Pump Calibration” (or activate one that is already in your rule group). Set run time to 1 minute. Select the pump you want to calibrate and a valve you can run water to without damaging plants. You must run water through the system while calibrating the pump to ensure an accurate calibration. Alternatively, a drain valve could be opened if an irrigation valve is not available.
5. Remove the suction tube and strainer from the graduated pitcher.
6. Read the mL level of the solution now. Subtract this new level from the original 1000mL or 200mL to determine the mL usage.
7. Use the following equation to determine your Max Gal/Hr rating for the pump.
 - a. $\text{mL Usage} \times 60 / 3785.41 = \text{Max GPH}$
8. Enter this value in the Max GPH field in the Growlink web portal.

To do this, go to the Central Feed System controller  Modules  16 Channel

Expansion and click the “Edit”  icon next to the device/pump that is being calibrated. Enter the new Max GPH value from the equation above in this field. Then **Save Changes** and **Update Controller**.

CONFIGURE MODULES

After calibrating the EC and pH Sensors, the next step is to assign (configure) modules. On the Main Controller there are 16 different channels used to open the 16 zone valves. Configuring modules is how you name the 16 different channels.

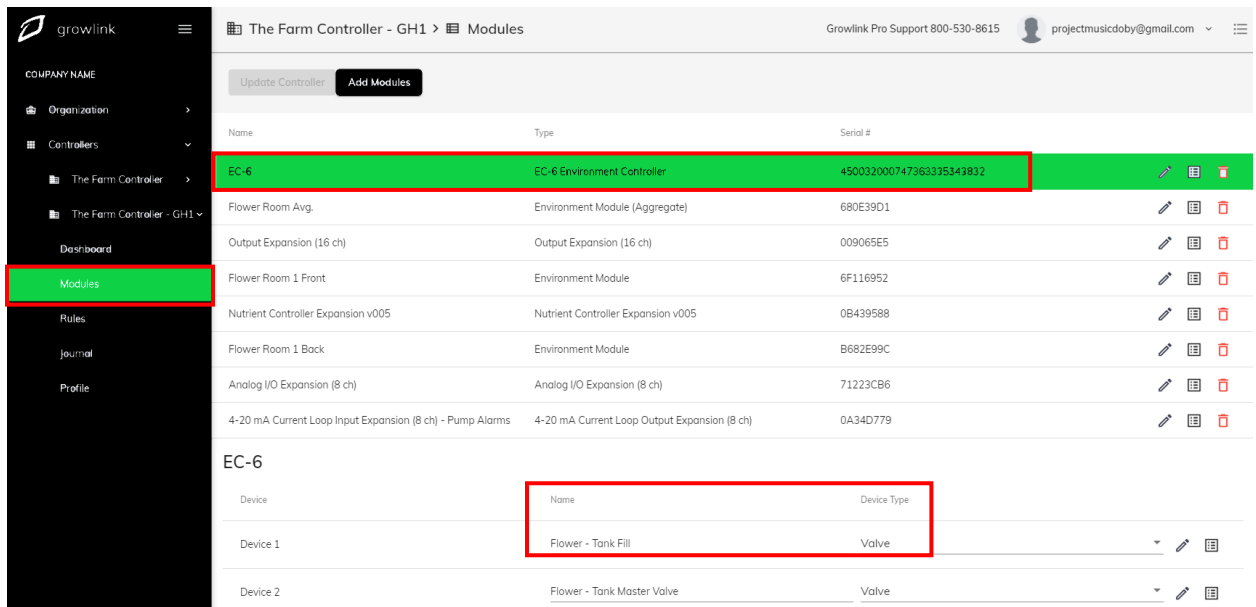
Steps to Configure Modules:

Main Controller

1. Go to the *Navigation* menu on the left, click **Modules**.
2. Click the **Main Controller** located on the *Name Board* at the top of the screen, i.e., EC-6.
3. Click the **Device Name** field and type the name of the valve. This is to designate where the water will be sent.
4. Click the **Device Type** drop down and select the desired option, i.e., Valve for Fertigation System.

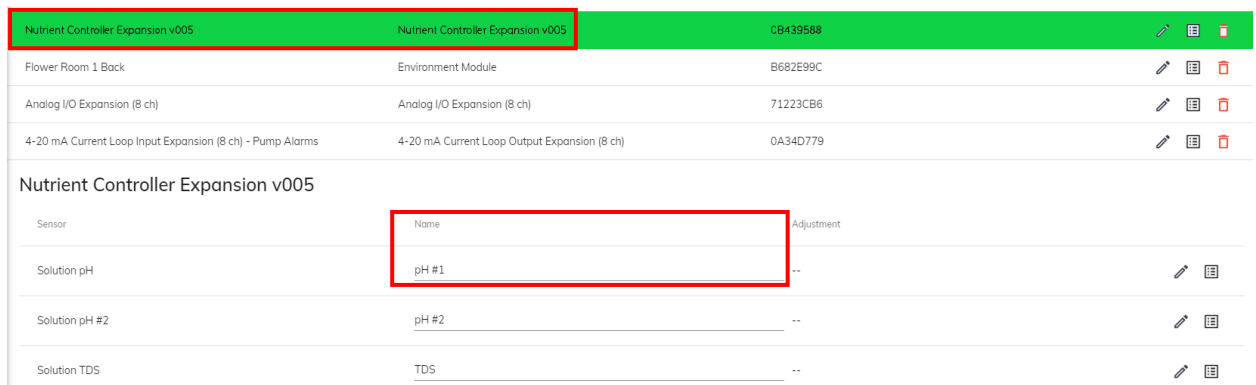
Note: Valve is preconfigured as the Device Type.

Device Type - Valve (Exclusive) - Only one rule can launch at one time. For example, if you have two different rules with two different valves, the system will only allow one valve to operate. This prevents two different rooms with two different recipes from being blended at the same time.



Nutrient Controller

1. Click the **Nutrient Controller Expansion** on the *Name Board* at the top of the screen.
2. Click the **Name** and rename the sensor, if needed.

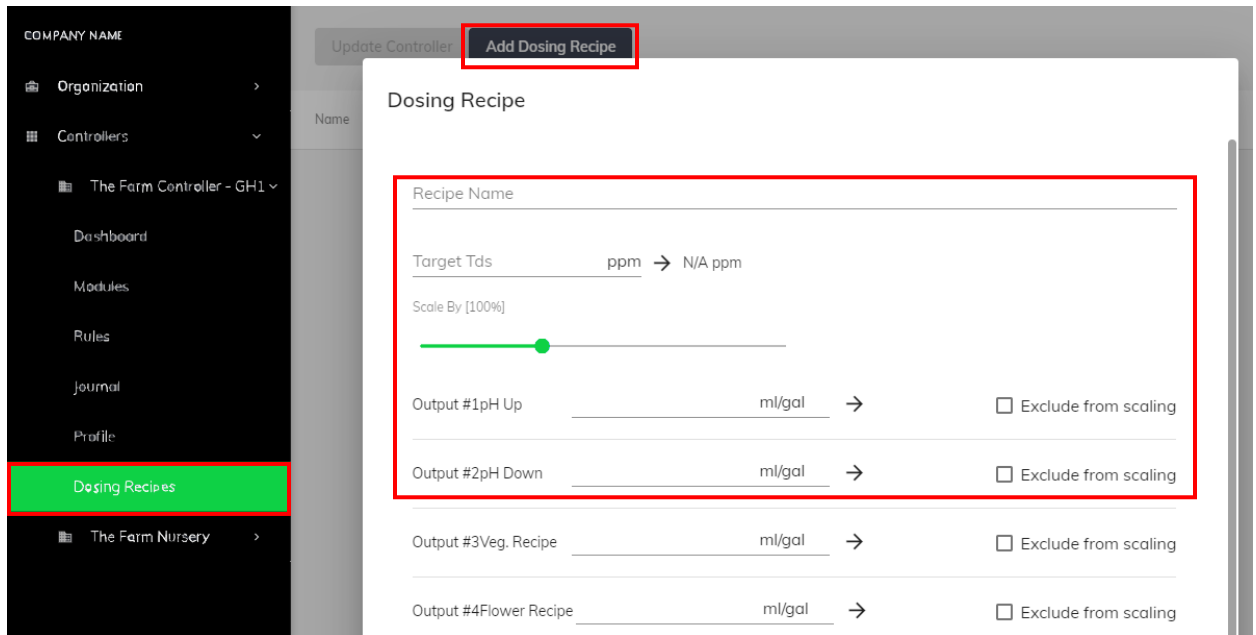


DOSING RECIPES

After configuring modules, the next step is to create Dosing Recipes.

1. Go to the *Navigation* menu on the left and click **Dosing Recipes**. The *Dosing Recipe* window displays.
2. Type the **Recipe Name**.
3. Enter the **Target Tds**. This is the Tds (Total Dissolved Solids) sensor indicating how strong to add the mix, i.e., 1000 ppm.
4. To program the recipe, enter the **pH Up** in the **ml/gal** field, if needed.

5. Select the **pH Down**, in the **ml/gal** field if needed.
6. Click **Add Recipe**. The Dosing Recipes results displays.



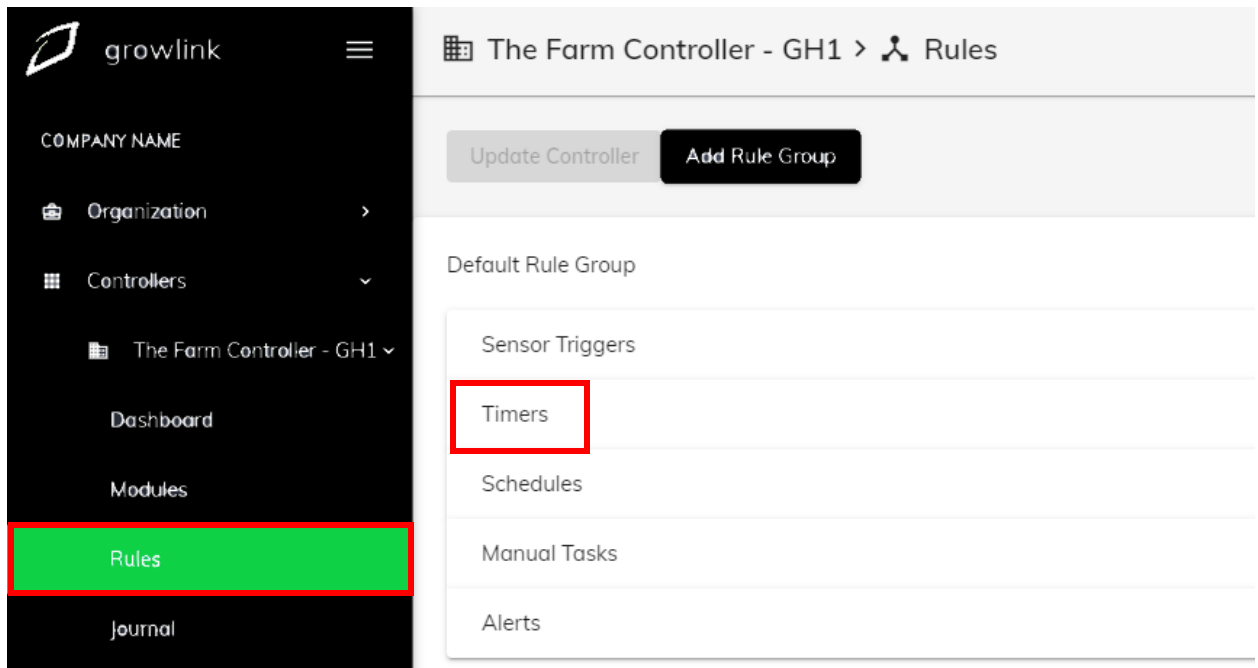
7. Click **Update Controller** to send the configuration to the controller.
Note: Refer to the *Nutrient Manufacturer* for the amount to inject per gallon of water.

RULES

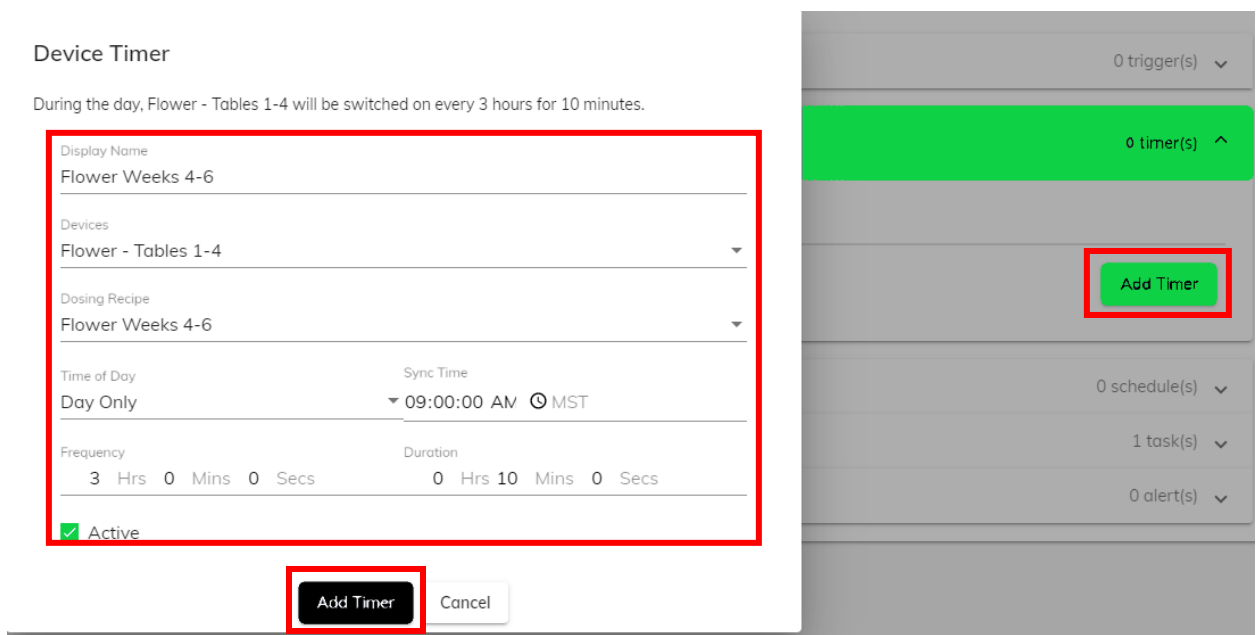
Rules are created to feed the rooms. In rules, timers are used most of the time for feeding.

Add Device Timer

1. Go to the *Navigation* menu on the left and click **Rules**. The *Default Rule Group* displays.
2. Click the **Timers** section.



3. Click the **Add Timer** button. The *Device Timer* window displays.
4. From the **Display Name** field, type the desired name, i.e., Feed Room 01.
5. Click **Devices** drop down and select the desired valve.
6. Click the **Dosing Recipe** drop down and select the desired recipe.
7. Click the **Time of Day** drop down and select the desired day. **Note:** The day is previously set in the Profile. **Hint:** The suggested time to feed is when the lights are on, Day only.
8. Set the **Frequency** Hrs, Mins, Secs.
9. Set the **Duration** Hrs, Mins, Secs.
10. Click the **Add Timer** button.



11. Click the **Update Controller** button. The timer is created for the room.

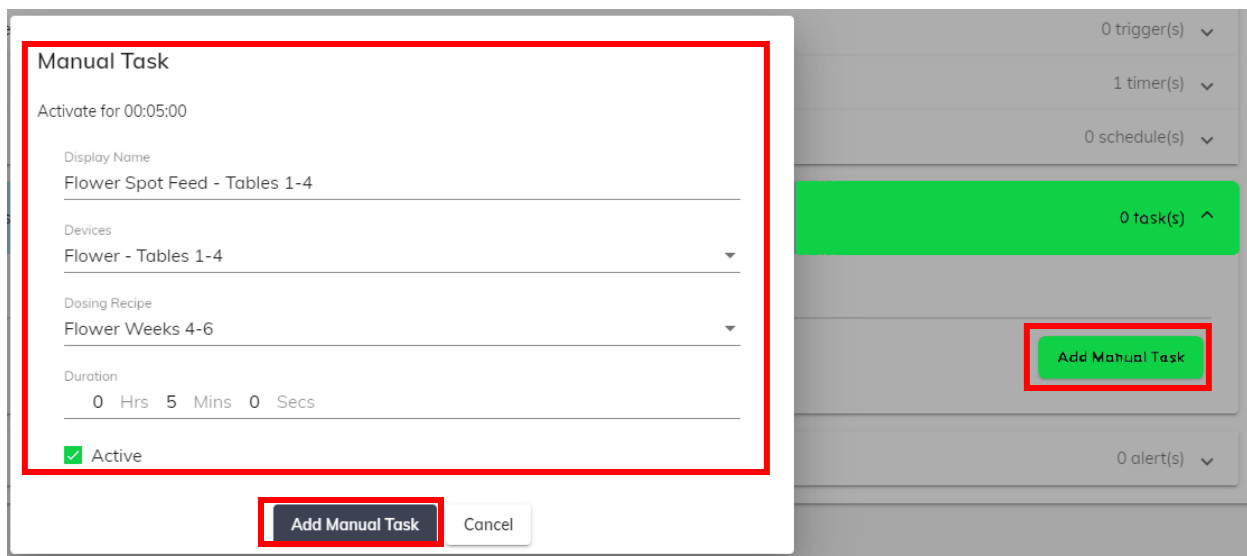
Multiple Timers can be created as needed for all the different rooms. *Repeat steps 1 -10* to create additional Device Timers.

MANUAL TASK

The Manual Task is used to add a play button on the Dashboard. For example, use the manual task to add 5 minutes of extra water to the plants.

Add Manual Task

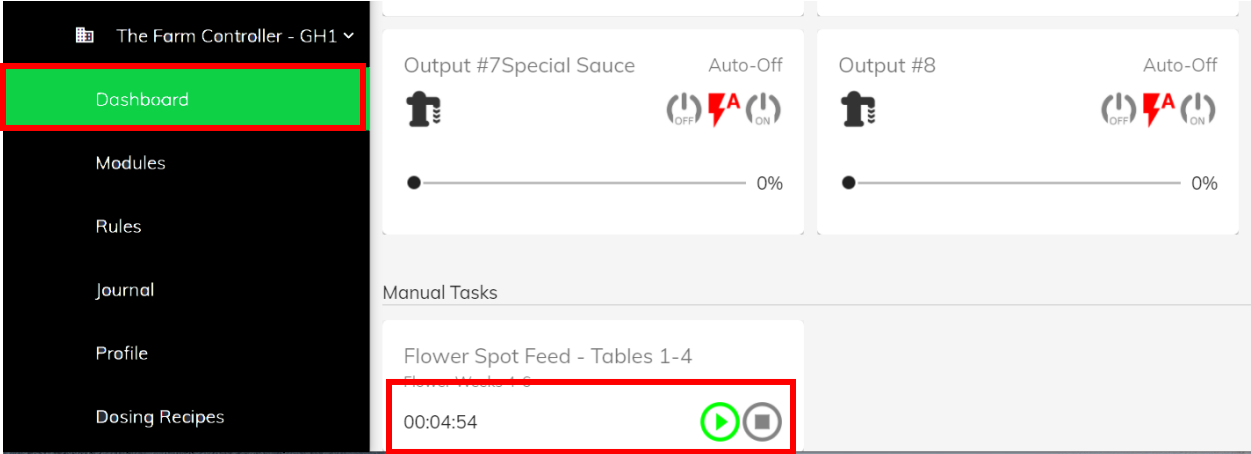
1. Navigate to **Rules**.
2. Click **Manual Tasks** at the bottom of the screen.
3. Click the **Add Manual Task** button. The *Manual Task* window displays.
4. From the **Display Name** field, type the desired name, i.e., Manual Water Room 01.
5. Click **Devices** drop down and select the desired valve.
6. Click the **Dosing Recipe** drop down and select the desired recipe.
7. Set the **Duration** to the default run time of **10 mins**.
8. Click the **Add Manual Task** button. The *Added New Manual Task* message displays.



9. Click the **Update Controller** button. The *Controller Update Pushed* message displays.

View the Dashboard

1. Go to the *Navigation* menu and click **Dashboard** to view the manual tasks.
2. Scroll to the bottom of the screen to the *Manual Tasks* section.
3. Locate the added manual task Display Name, i.e., Manual Water Room 01.
4. Set the desired extra **Min** using the up or down arrow and click the **Play** button.



The room will receive the extra watering time set.

USING THE GROWLINK™ APPLICATION

You can manage your facility from anywhere with a mobile device.

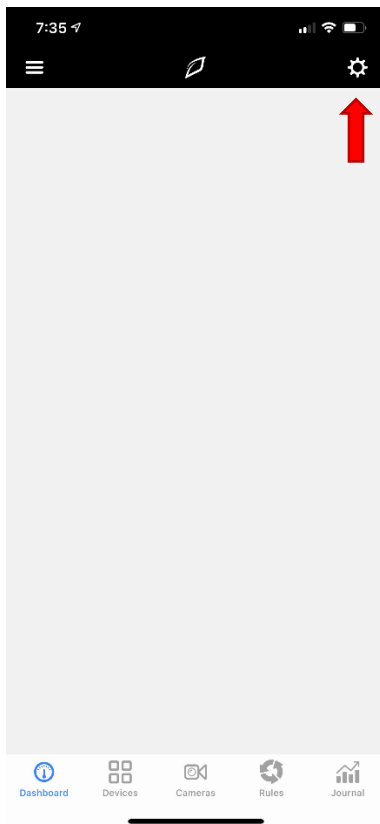
Install the Growlink Application

1. Open the Google Play Store or the App Store on your phone.
2. Find the Growlink app and tap the **Install** button.
3. Sign in and open the app.
4. Read the Terms of Service and tap the **Accept** button.
The *Account Setup* screen displays.
5. Fill out all the fields and tap the **Create Account** button.

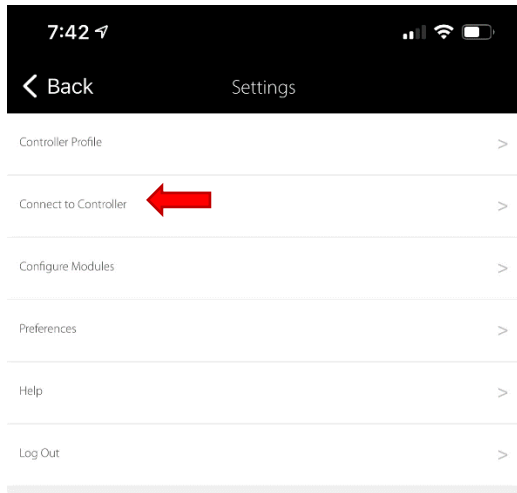
WIFI Setup for Android and iOS

Important: Device must be in listening mode. To place the controller into listening mode, press and hold the **bottom button** and wait until the LED flashes **blue**.

1. Navigate to the app and tap  **Settings** on the top right corner.

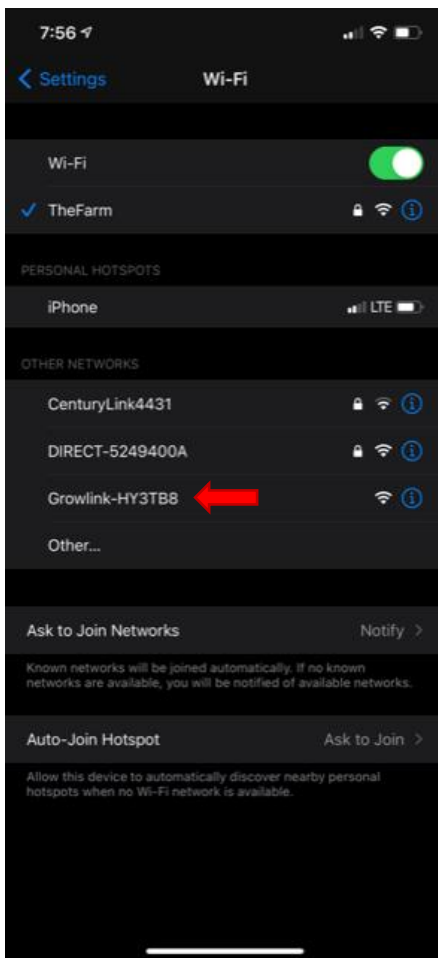


2. Go to the *Settings* menu and select **Connect to Controller**.



The *Connect to Controller Hub* screen displays. Next, Open the Wi-Fi settings on your hand-held device.

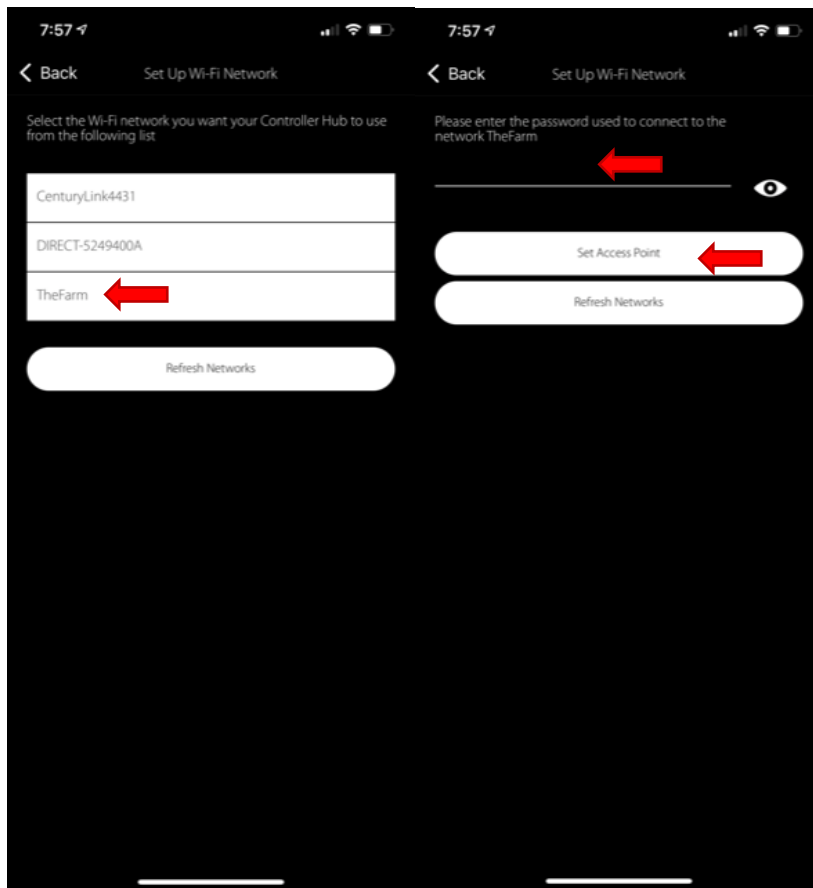
3. Connect to the **Wi-Fi network** that matches your SSID for the controller's enclosure.



4. Switch back to the Growlink App. Once you are connected, the *Setup Controller Hub* screen displays. This confirms you are successfully connected to your Growlink Controller Hub. At the bottom of the screen tap **Next**.

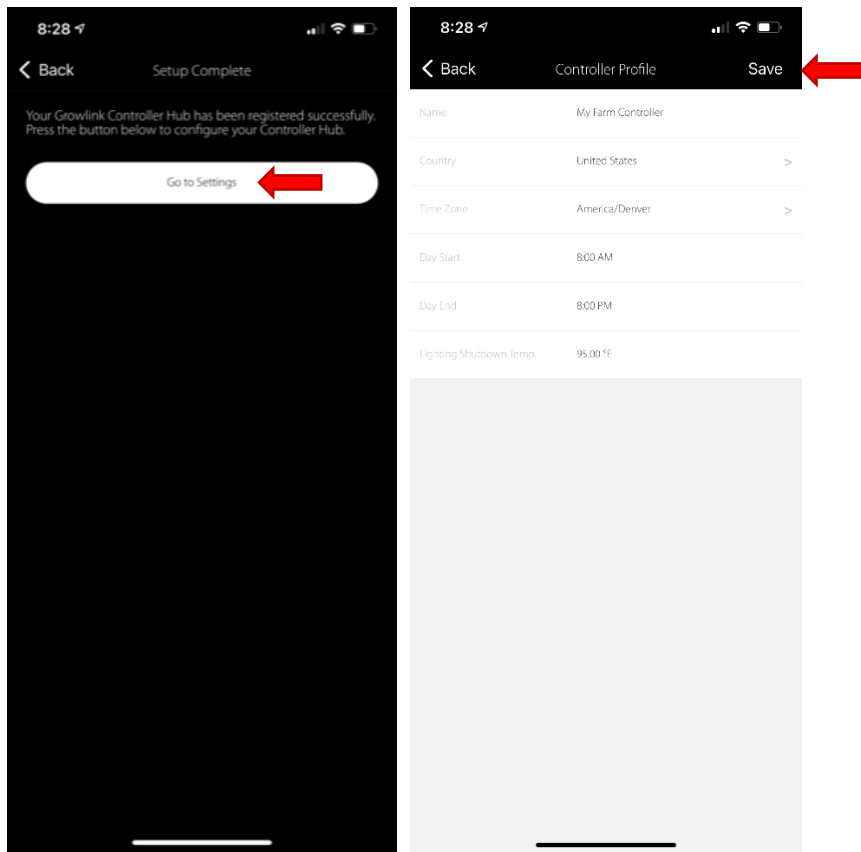


7. Select your **Wi-Fi network** from the list of networks and enter **your Wi-Fi password**. Then tap on **Set Access Point**.



After you have connected your Wi-Fi, the LEDs on your Controller will flash. When it is connected it will breathe **green**.

The *Setup Complete* screen displays. You can now name your controller i.e. "My Farm controller". Next, you can set the time zone and country for your controller by tapping **Go To Settings**. After entering desired settings, tap **Save**.



8. Setup is now complete and you can view your controller from the main **Dashboard**