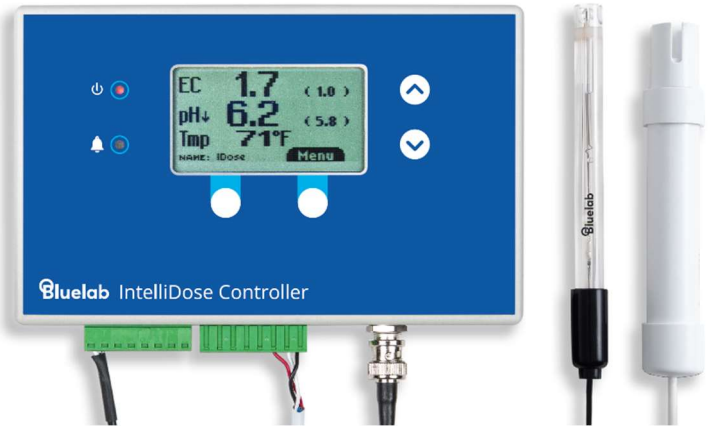
IntelliDose Controller User Manual



English

Contents

1.0 Introduction & Overview

1.1 Features

- Nine outputs available for dosing nutrients, additives and pH
- Four (24 VDC) outputs available for irrigation if not used for nutrients.
- Controls all growing methods - NFT, DFT/DWC, soil, media, drip, and aeroponics.
- Proportional dosing rapidly adjusts between irrigations.
- Sequential pump control allows each additive time to mix.
- Displays EC, CF, TDS, ˚C, ˚F, pH
- Set different Conductivity (EC) for day and night.
- Water level control – to lower EC
- Adjustable alarms and dosing lockouts prevent overdosing or running dry.
- Control 120 / 240 VAC pumps, heaters and chillers on a timer, when connected to a Bluelab Power Relay.

When connected to Edenic*

- Instant alarm alerts to your phone.
- Remote monitoring and control.
- History reporting to assist data-driven decision-making.

*Requires Bluelab IntelliLink and internet access

What are Dosing Lockouts for? They are a built-in safety feature that stops Acid or Nutrient dosing if an error is detected in the system.

1.2 What's in the box?

1x IntelliDose controller
1x EC probe
1x pH Probe
1x Sample pot with all fittings
6x Calibration solution sachets (to get you started)
1x 24V DC 2.5A power supply
4x IEC Power cables (Type A (US), C (EU), G (UK) and I (AU))
1x 3m USB cable
1x Mounting hardware
1x Instruction manual

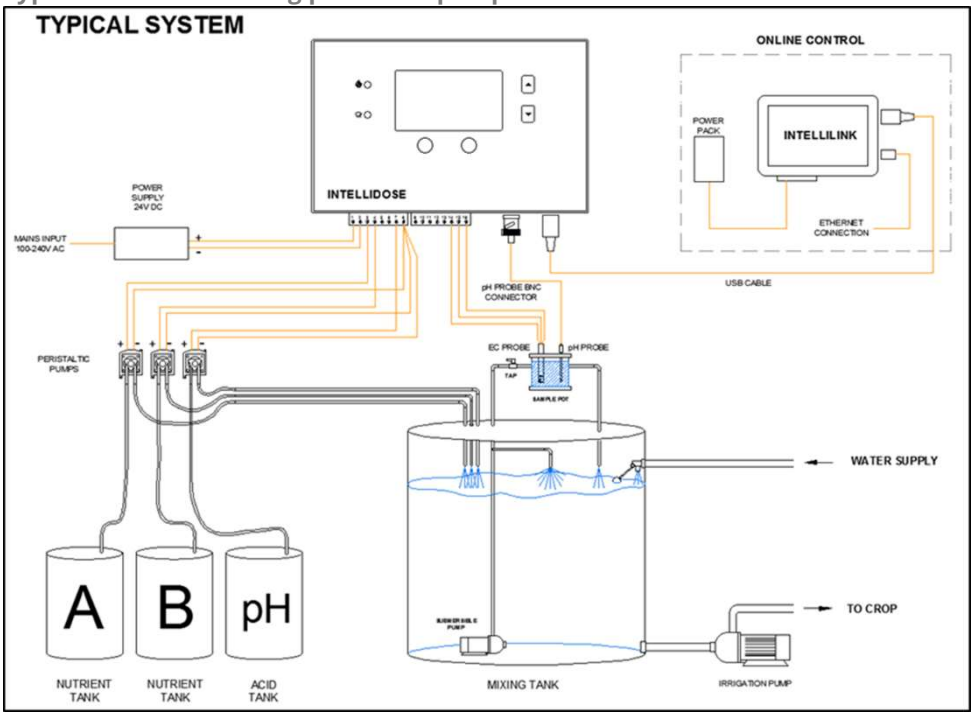
1.3 Key functionality

The **IntelliDose** is suitable to most hydroponic applications. To keep the user interface as simple as possible, only the readings and settings relevant to the selected features are displayed on the controller's LCD. For access to more advanced options connect your IntelliDose to Edenic software via an IntelliLink (purchased separately).

We recommend using a quality handheld meter to spot-check your EC & pH on a regular basis, ensuring your probes are reading correctly and holding calibration.

Install the IntelliDose controller to one side of the mixing tank where it will not be exposed to splashes and vapours. Remember, the sensor leads (5m) must be able to reach the sample pot which should be mounted just above the top of the mixing tank.

Typical installation using peristaltic pumps



TIPS:

- The output terminal order is dynamic and will change based on the number of components (pumps and solenoids) that you are driving.
- Mount sample pot just above top of tank as many small pumps have low head pressure capability.

- Adjust the valve on inlet pipe to the sample pot to achieve a steady flow without excessive turbulence or air bubbles in the sample pot.
- Mount IntelliDose away from moisture, preferably just outside grow room.
- Clean the Conductivity sensor and calibrate all sensors before use.
- Fill stock tanks and mix tank with plain water and run for a day to check for leaks and observe operation is correct.

IMPORTANT:
When using automatic dosing, the stock solutions and acid/alkali must be diluted. Diluting the acid to below 2% strength ensures it does not react adversely with your nutrient and will also increase the life of the peristaltic tubing. This is particularly important if a small mixing tank (e.g. under 1,000L/250gal) is used.

You may need to experiment with the dilution rate of the nutrients/acid/alkalai so that three, 3 to 8 second doses result in a change of;

- Nutrients: TDS of 50ppm (0.1EC or 1CF).
- pH, of 0.1pH.

It is important the tank is continually stirred while dosing and there is a continuous gentle flow through the sample pot. If the sample pot is mounted too high there is a danger of the flow ceasing if the pump loses pressure (head) for any reason such as wear or a partially clogged input filter.

1.4 Edenic Software

If your IntelliDose is connected to an IntelliLink then it can send and receive data from Edenic. Edenic by Bluelab is a cloud-based software solution that can be accessed on your mobile device or computer. Allowing you to remotely configure and control your parameters, schedules and set & receive alarms.

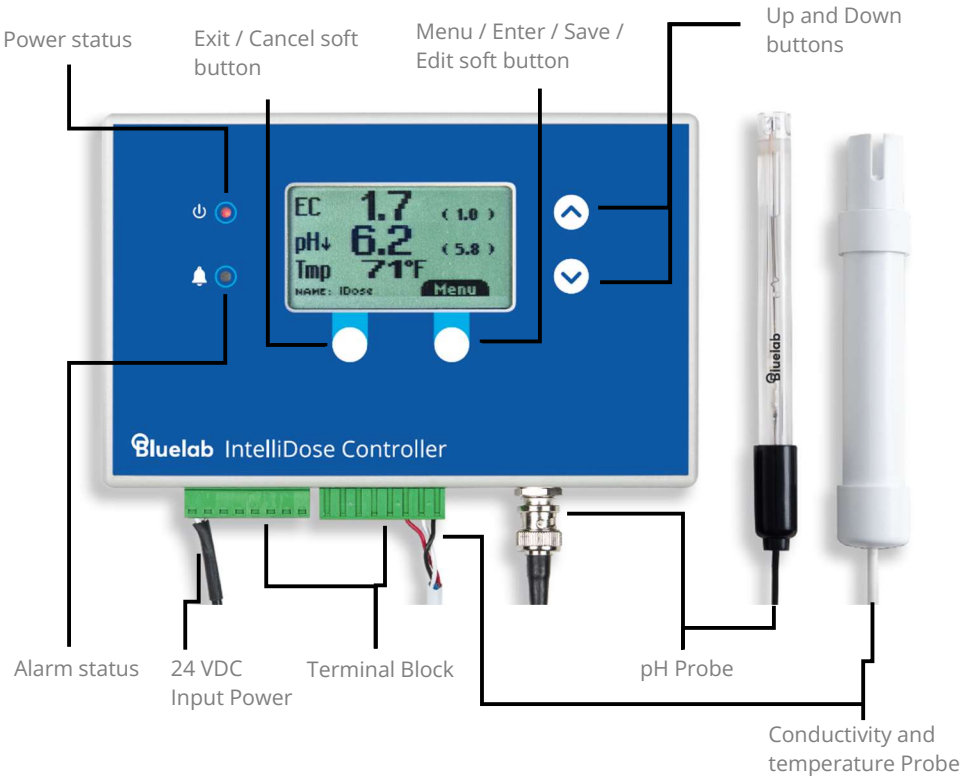
Although you can set almost everything directly on the controller, the below features are only available in Edenic.

- Wiring diagram for IntelliDose dynamic terminal
- Scheduling
- History reporting, exports and graphs.

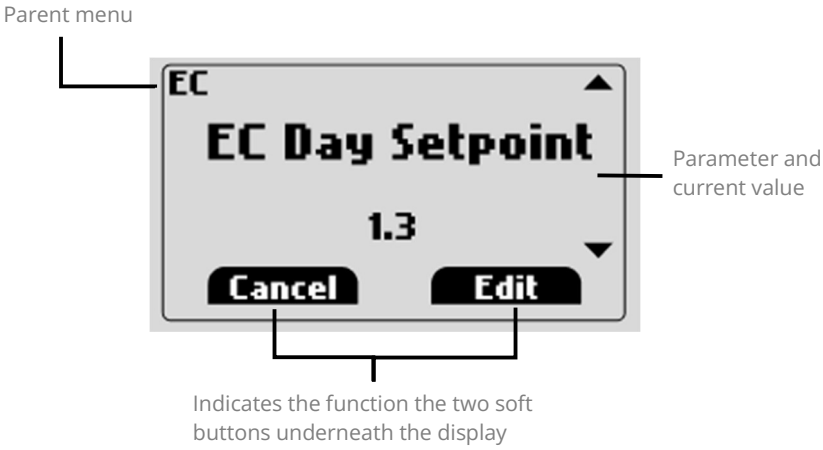
For more information on Edenic please visit https://www.edenic.io/

2.0 Understanding your device

2.1 The controller



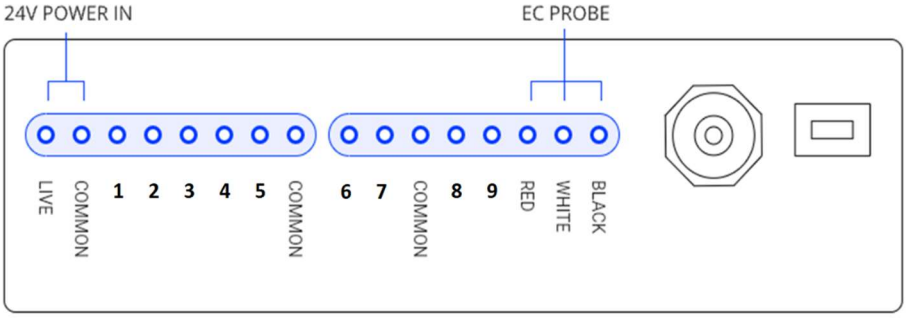
2.2 The display



2.3 Terminal block

The IntelliDose output voltages for dosing and irrigation are dependent on the power supply adapter used. The IntelliDose is supplied with a 24VDC power supply, but can be run from a 12-24 V DC or AC power supply with a maximum of 2.5 A.

Terminal output is 24 VDC with the Bluelab supplied Power supply.

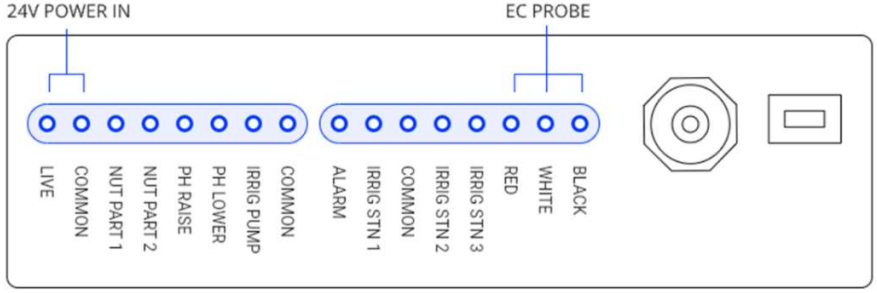


The IntelliDose has 9 output terminals, shown in the above diagram numbered 1-9. These are dynamic and change depending on the confiuration of the IntelliDose. If connected to Edenic, a wiring diagram can be automatically generated by the App.

The outputs are assigned in priority with the order being;

- Nutrients (From 1 up to 9)
- pH Raise
- pH Lower
- Irrigation Pump
- Fresh Water
- Alarm
- Irrigation solenoids (From 1 up to 4)

Example configuration for a drip to waste system would be two nutrient parts (A and B), pH Raise, pH Lower, Irrigation Pump, Alarm, Three irrigation stations. See the diagram below for how the IntelliDose would configure that;



2.4 Menu

The two keys at the bottom of the display are “soft keys”. This means their function, is shown on the screen above them. After switching on, you will see the right-hand key has the label “menu” on the LCD above it and the left-hand key is unused at this point. To the right of the LCD screen are two arrow keys. The arrow keys are used for moving up or down through the menus, editing a numeric value, or to select between different options.

DOSING	Set your targets, dosing times, dosing intervals and enable different day-night conductivity values.
CALIBRATION	Calibrate pH or Conductivity probes using a calibration solution. For pH you will need pH 7 and pH 4 calibration solutions. For Conductivity you will need EC 2.77 calibration solution.
OVERRIDES	Temporarily manually override outputs to test system install or do additional dosing when required.
IRRIGATION	Only available if irrigation is enabled in the Configure > Advanced > Output menu. Set irrigation run time, Irrigate at fixed times or frequency and irrigate day only or at day and night.
ALARMS	The alarms can be enabled to drive a buzzer/siren or to give mobile notifications when using Edenic. Each of these can be silenced or enabled. Any enabled alarm will sound when a relevant reading deviates outside set limits.
CLOCK	Set the time for day start and day end – required for day/night EC settings. Set the current time and date.
CONFIGURE	Adjust units (Conductivity and Temperature) and date format. Mute the buzzer. Adjust screen contrast and brightness. Select what outputs you need enabled.

When you first access the menus, go to Configure > Advanced > Output and program which features you are using (ex: pH Dosing direction and Irrigation). If you do not install a feature, you will not have access to set it up in the previous menus.

Example, If you wish to change irrigation timings, move down to irrigation and press “enter”. Now pressing the down and/or up arrows moves through this sub-menu, press enter to access an item. After making any changes the soft keys will allow you to either save the new setting or to cancel and exit out of that screen.

3.0 Initial Configuration

3.1 Configuration menu

Configure	Offline Log Time	Period in which variables are logged onto the device.
	Nutrient Units	Set conductivity units as EC (Default), CF or TDS)
	Date Format	Set date to be mm/dd/yy or dd/mm/yy
	Temperature Units	Adjust between °F (default) and °C
	Buzzer	Mute or enable (Default) the internal buzzer
	Screen Contrast	Adjust screen contrast to help with visibility
	Backlight	Adjust screen brightness to suit the environment
	Info	Version information for IntelliDose and connected probe.
	Advanced	• Dosing type - Simple (default) or Propotional Dosing mode - Sequential (default) or simultaneous Lockouts - Stop the device from dosing if measured values are outside accepted range. Outputs; • Nutrient Parts (default 2) • pH Output (default Lower) • Irrigation - disable (default) / enable irrigation • Station Outputs - disable (default) / enable. Only visible if irrigation is enabled • No. Station Outputs - Adjust from 1 to 4 depending on the number of zones. • Station Mode • Water dosing - disable (default) / enable irrigation • Alarms - disable (default) / enable external alarm output

3.2 Selection of units

You may select either EC, CF or TDS (ppm) units for the Conductivity measure (nutrient strength) and either °C or degrees °F for temperature. The acidity or alkalinity is always measured in pH. In this manual, we use EC (electrical conductivity) to denote either EC, CF or TDS. The date format is selectable between mm/dd/yy and dd/mm/yy formats.

The TDS standard used for this controller is EC x 500 but it is possible to select EC x 640 and EC x 700 when using Edenic software.

3.3 Powered Outputs

Other menus (such as irrigation) are only accessible if that function is enabled. Before installing it is best to go through the Advanced > Outputs menu to enable functions you require.

Note there are 9 outputs, the IntelliDose will block settings if all 9 are allocated.

Nutrient Parts
Adjustable from 1 through to 9 (default is 2 parts). Set this for how many nutrient parts you will be mixing. If using an A and B nutrient mix then you would only need 2 nutrient parts.

pH Output
You can have pH Lower (default, and most common for hydroponic operations), pH Raise or both.

Irrigation
Enable irrigation pump control, this is disabled by default.

Station Outputs
Disabled by default gives one output for irrigation, enabling gives a single irrigation station by default. This will give two irrigation outputs (one for the pump and one for the zone solenoid valve). Only visible if irrigation (above) is enabled.

No. Station Outputs
Adjust from 1 to 4 depending on how many irrigation zones you have.

Station Mode
Set as either **Independent** – each irrigation zone can have it's own trigger/timing or **Sequential** – all the irrigation zones run on the same timing one-after-another.

Water dosing
Control a pump for water top-up, required in Nutrient Film Technique (NFT) operations, to reduce conductivity. This is disabled by default, and is dependant on different EC for day and night.

Alarms
This output is for a light/siren and will be powered whenever any alarm is raised from the IntelliDose settings. By default it is disabled.

3.4 Other settings

Adjust the remaining settings based on your requirements.

- The Date format,
- Internal buzzer enabled or disabled
- Screen brightness
- Screen contrast

4.0 Installation

4.1 Mounting

The IntelliDose controller should be installed in a cool, dry place out of direct sunlight. Remove the screws holding the back, fit the mounting feet, then screw to the wall. If using the dry wall (plaster board) anchors, use the longer screws supplied. If fixing to a plywood board, use the shorter screws.

4.2 Configure Outputs

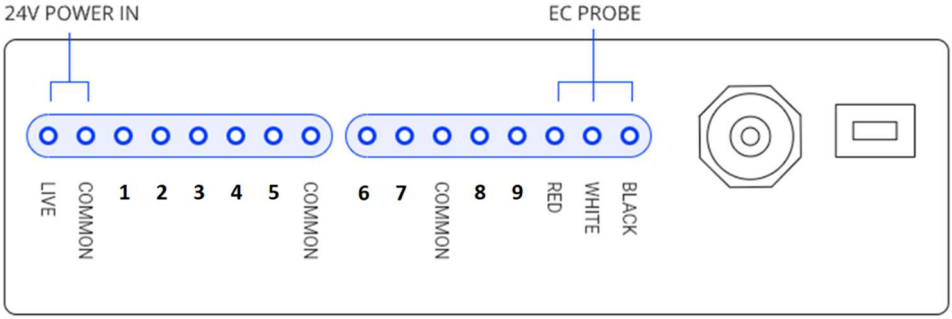
When you first access the menus, go to Configure > Advanced > Output and program which features you are using (ex: pH Dosing direction and Irrigation). If you do not install a feature, the specific menus for that feature will be disabled. Refer section 3.3.

ADDITIONAL TIPS:

- If an irrigation pump is used, a second small pump should be used to circulate the solution through the sample pot and keep the tank stirred.
- If the irrigation water is returned to the reservoir tank, allowance must be made for the level to rise above the float valve level.

4.3 Wiring probes

The low voltage power from the adapter is connected to the two left connection terminals. On the included power supply, the white wire is Live and the black wire is Common.



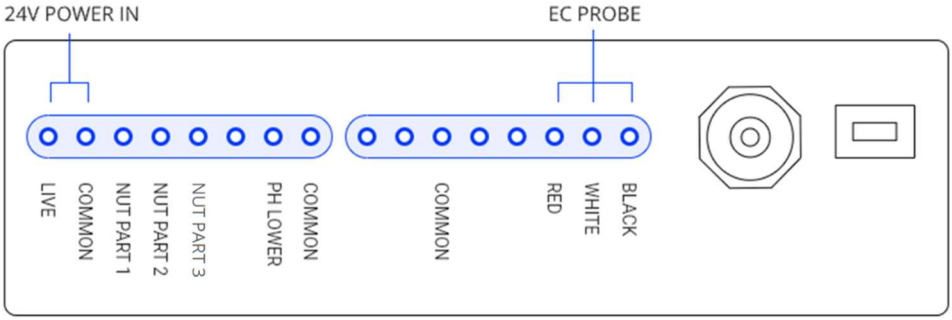
The Conductivity probe (EC) connects to the far right terminal, with the red, white and black wires connected as per the above diagram.

The pH probe connects to the BNC terminal, it needs to push in and then turn to click into place.

4.4 Connecting pumps and solenoids

The wiring diagram for pumps and solenoids depends on your configuration of the IntelliDose. The outputs from 1 to 9 change depending on the options selected.

Example wiring diagram for dosing 3 nutrient parts and pH lower.

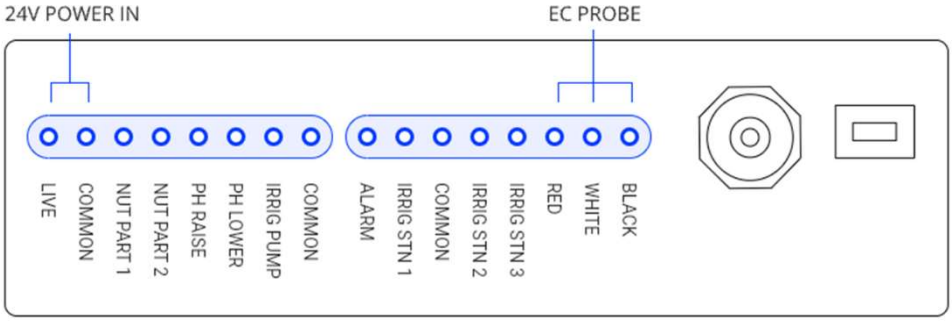


The connection diagram for more than 3-part nutrients must be mapped by Edenic software, AFTER configuration has been complete. If you are not using Edenic, please visit the Bluelab support knowledge base for wiring diagrams of all configurations.

As a guide, from left to right the outputs will be in the order of;

Nutrients, pH Raise, pH Lower, Irrigation Pump, Water top up, Alarm, Irrigation stations.

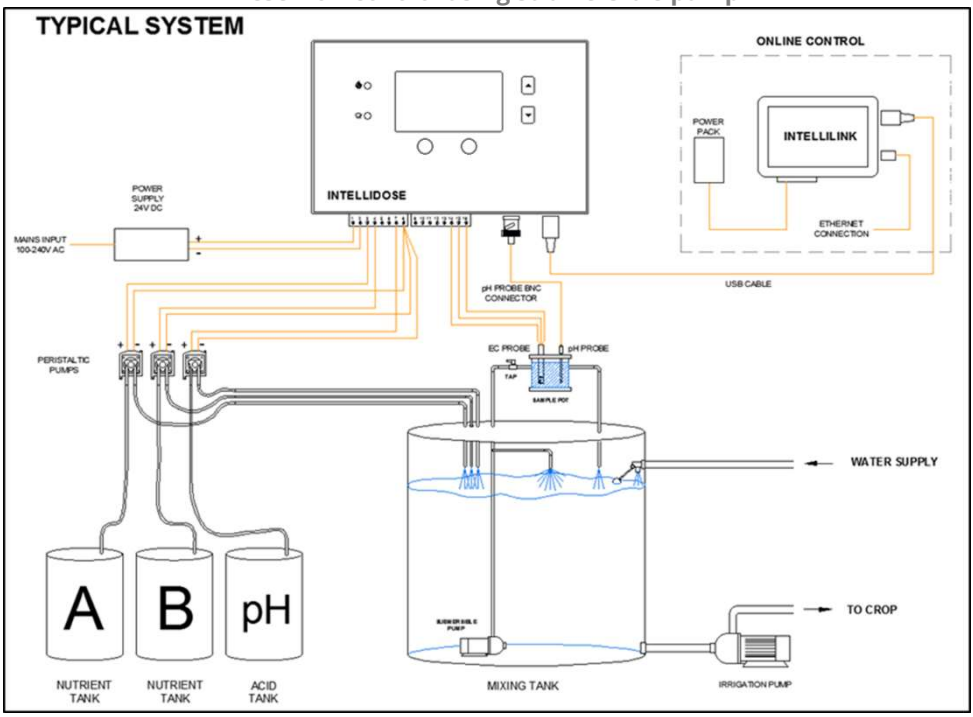
Example wiring diagram with 2 nutrient parts, pH Raise, pH Lower, an Irrigation Pump – with 3 irrigation stations and an alarm output.



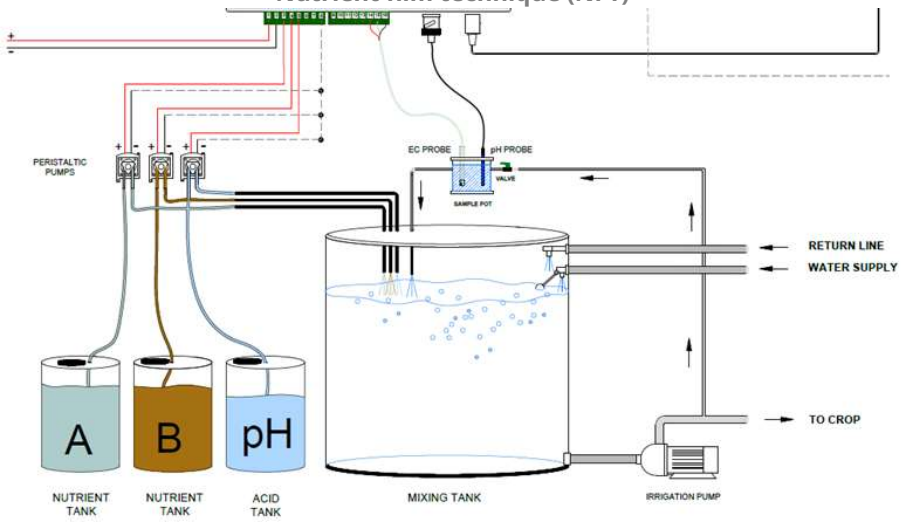
4.5 Typical installation diagrams

The following diagrams are illustrative of typical installations. All of these are using two nutrient parts and pH Lower.

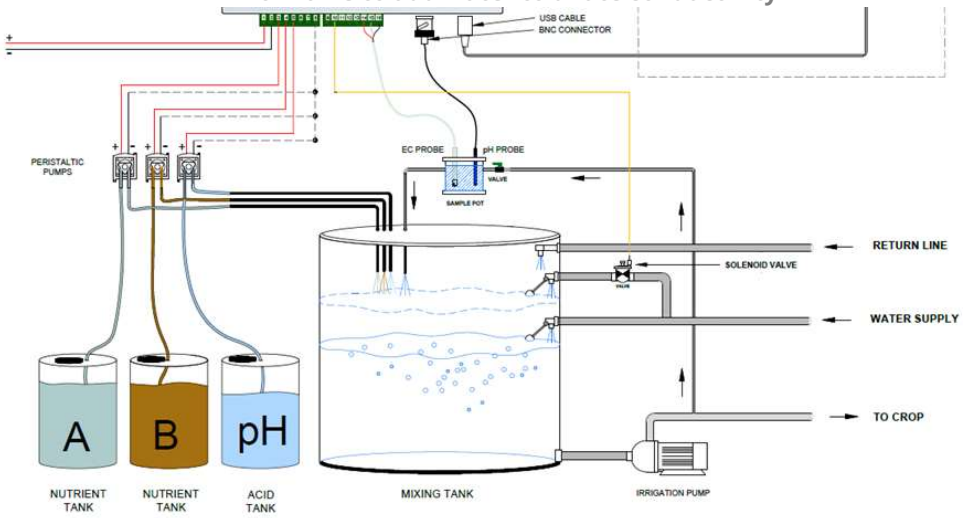
Reservoir control using submersible pump



Nutrient film technique (NFT)

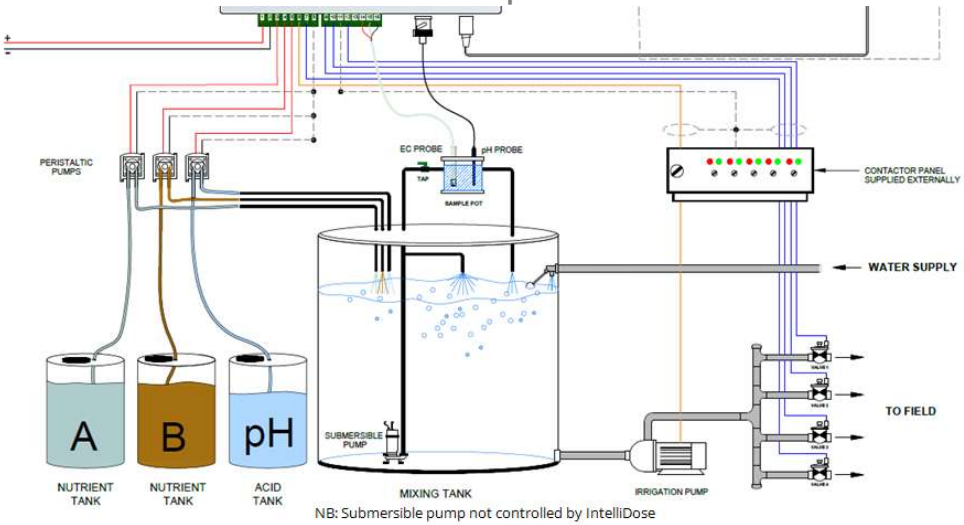


NFT with valve to add water to dilute conductivity



NFT Dosing system with water top up

Drip to waste with solenoid valves and irrigation pump controlled via a contactor panel



NB: Submersible pump not controlled by IntelliDose

Drip to waste with irrigation stations

4.6 Controlling 110/240 VAC

The IntelliDose outputs are 24 VDC from the supplied plug pack. If you need to drive larger devices that are 110/240 VAC powered (i.e an Irrigation pump) you can use a Bluelab Power Relay R4.

Please refer to the Bluelab Power Relay R4 Manual for complete details of the product. You will need the right version for your regional socket type. The Power Relay R4 has 4 separate outputs, but the total mains current draw should not exceed the rating (refer to product specification for more information). The input cable supplied with the Bluelab Power Relay R4 unit has the following wiring configuration:

Wire Colour	Designation
Black	Common (GND)
Yellow	Output 1 (S1)
Green	Output 2 (S2)
White	Output 3 (S3)
Blue	Output 4 (S4)

4.7 Peristaltic Pumps

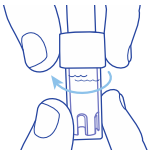
Bluelab Peristaltic pumps are rated for 12 - 24 VDC. You can run up to 9 peristaltic pumps from an IntelliDose Controller. Peristaltic pumps should be installed above the stock tanks and the reservoir. Place stock tanks on the ground, next to the reservoir.

Important: Peristaltic Pump mounting height should not exceed maximum 2.1 metres / 7 feet measured from the bottom of the stock tank.

4.8 Placement of the probes

- The tip of the Bluelab pH Probe must be submerged in the liquid.
- ***Do not pour concentrated nutrient solution or pH adjuster directly onto probes when in the reservoir. Strong acids, alkali and nutrients damage the probes, trigger the alarms (if on) or cause the pump to accidentally dose or stop dosing.***
- ***Ensure the probes are in an area where the reservoir/tank solution is well mixed.***
- ***pH and conductivity probes can be fully submerged in the solution.***

1. Remove the storage cap from the pH probe by gripping the top of the cap and gently twisting the base one rotation to loosen. Slide the storage cap off the pH probe.

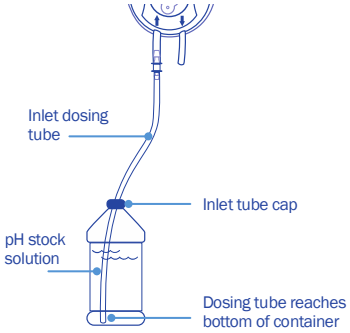


2. Fit the (optional) pH probe holder to the stem of the pH probe using a gentle twisting motion.
3. Place the pH probe into the reservoir/tank and push the suction cup onto the side of the reservoir but far enough down so the pH probe tip is always in the solution. This prevents damage to the probe from any movement in the reservoir/tank.
4. Place the Conductivity probe alongside the pH probe.

4.9 Set up inlet dosing tube

Ensure the inlet dosing tube will reach the bottom of the pH stock solution container.

There also needs to be enough tube left for the outlet dosing tube to go into the reservoir/tank.



5.0 Dosing setup

Mixing nutrients - IMPORTANT - PLEASE READ THIS CAREFULLY!

When using any automatic doser, it is important the nutrients and acid/alkali are diluted to 2%. The instructions on many dry powdered nutrients tell you to prepare the stock solutions to quite a concentrated level (100:1 or more). Liquid nutrients are also very concentrated. For a small mixing tank, this will be too strong and even if very short doses are given the system will overshoot. If using powdered nutrients, mix into water so that for each 1 Kg (2.24 lbs) of powder you obtain at least 20 L (5 gal) of solution. Liquid nutrients should be diluted with water to make up at least 5 times their original volume. Acids and alkalis should be diluted to be less than 2% strength. If using strong acids, always wear goggles, gloves and add the acid to the water then stir well.

5.1 Dosing Menu

EC And pH	Setpoint
	Dosetime
	Dosing Interval
	Enable (default) / disable
	Day/Night EC (default is same)
Mix %	Set the % of on time for each nutrient part. 100% will be equal to the EC Dosetime.
Dosecount	Dosecount failsafe disable (default) / enable
	Max EC doses/hour
	Max pH doses/hour
	Hold-off Time
	Reset EC dosecount
	Reset pH dosecount

Dose times and intervals are set by trial and error. The smaller the reservoir, the smaller the dose time needs to be. The strength or concentration of your stock solutions will also affect the dose time setting. The stronger the stock solution, the shorter the time the pump runs. If you are using a small reservoir tank you must ensure your stock solutions are very dilute.

5.2 Set Point

Set your targets for pH and Conductivity (EC)

5.3 Dose time

When you have the dilution right, you should get a 0.1 change in EC with three 2 second (minimum) dose times of A and B solutions.

In a similar way, the pH should change by about 0.1 pH with three 2 second doses of pH adjuster solution. If it takes four or five doses to change, that is fine, but if it changes by more than 0.1, you will need to dilute the solution further.

Best dosing accuracy is achieved with longer dose times. If any ratios of a multi-part mix are set to a short dose time, then it is important to ensure dose time is still above 2 seconds.

5.4 Dose interval

The delay time between each dose. This gives the system time to mix the stock solution into the reservoir thoroughly before the next dose, allowing the Bluelab IntelliDose Controller to measure the solution accurately.

Start with a longer Dose Interval and adjust back as you go. The more thorough the mixing in the tank, the shorter the interval can be. Larger tanks will require a longer mixing time.

5.5 pH Raise or Lower

For most growers, pH lower is the common requirement. Depending on water source, nutrients and plant growth, you may find you need to use pH Raise at certain growth stages. The IntelliDose can be configured to run no pH adjuster, pH raise, pH lower or both. If you choose to run both, you will be able to wire up separate peristaltic pumps to the raise and lower outputs, but the system will only be able to dose in one direction at a time.

To change direction, you need to manually switch either using the controller keypad navigate to Menu > Configure > Advanced > pH Output Setup or via Edenic. This manual intervention is a safety feature to prevent dosing in the wrong direction.

5.6 Multi-part dosing

For 1-part dosing, only one dosing pump is used to add nutrient to the mixing tank. When 2-part dosing is selected then two dosing pumps will be used to add part A and part B stock solutions. If the part A and part B do not dose at exactly the same rate (one tank empties quicker than the other) there are a number of reasons why this may occur. Including different pipe arrangements, filters partly blocked, tanks or dosing valves mounted at different heights and even the difference in specific densities of the stock solutions.

To compensate for this, you may adjust the two dose rates electronically by reducing either A or B dose rates below 100%. For example, if you set Nutrient 1 at 100% and Nutrient 2 at 95%, then Nutrient 2 pump will dose for a shorter Dose Time each cycle. Always leave one at 100% and reduce the other nutrients.

Example:
If dose time is set to 5 seconds, and nutrient part 2 is set to a ratio of 10%. A ratio of 100% = 5 seconds, so a ratio of 10% be only ½ a second, an insufficient time to achieve accurate dosing.

The solution is to increase the dose time to 20 seconds. At 20 seconds a 10% Mix ratio nutrient will dose for 2 seconds (which will be more accurate).

If these longer nutrient doses increase the EC by more than the desired 0.1 EC (50ppm) every 3 cycles, you will need to further dilute the stock solutions or use a larger reservoir tank - or a combination of both.

Another approach is to dilute only the nutrient parts that require lower ratios. For example, a recipe recommends 100:50:10. If the dose time is set to 5 seconds then part A would dose for 5 seconds, part B for 2.5 and part C for only 1/2 second. By diluting part C in water with 1-part C to 4-parts water, it would reduce its strength to 1/5th of the original. Then you would schedule 100:50:50 which will be more accurate.

5.7 Advanced Dosing

The following are advanced dosing capabilities of the IntelliDose Controller and can be skipped by most people.

5.7.1 Water top up

By installing a mixing tank with two water level ball valves, one at a low level and other at a high level, it is possible for the IntelliDose controller to dilute the nutrient tank by adding water. This is done by operating a solenoid valve in line with the high-level valve.

This function is mainly of interest to leafy greens growers using a NFT grow system.

5.7.2 Proportional Dosing

DEFAULT – OFF
Not available with more than 2 nutrient part-mix.

Proportional dosing allows rapid dosing toward the set point. This causes the dose size to automatically vary in proportion to the difference from the current EC reading.

A maximum and minimum dose time must be entered. The maximum time should be set so that a dose of this size would raise the EC from its raw water value to 80% of the setpoint value in a single dose. The minimum dose time should be set to achieve a rise in EC of 0.1 EC (1 CF, 50 ppm). The controller will automatically select the most appropriate dose time within this range, depending on the measured EC. When starting with a tank of pure water, the controller will make one very large dose followed by smaller doses as the setpoint is approached.

This is useful in irrigating (drip) systems that do not re-circulate as it allows rapid dosing after each irrigation occurs.

5.7.3 Sequential Dosing

DEFAULT - ON
This causes the dosing pumps or valves to activate in sequence, one after the other and allows high current valves or pumps to be connected to the unit without fear of overloading the controller or its power adapter. **If in doubt** about the current required to drive the pumps, **always select sequential dosing**. If 3 or more nutrient parts are selected sequential dosing is enforced to avoid damage to the controller. The IntelliDose is supplied with a 2.5 A power supply, so it is safer to run the pumps individually, to avoid overloading the power supply and blowing the internal fuse.

5.7.4 Day/Night EC

Different Conductivity for day and night is useful for crops needing a weaker solution during the heat of the day and a stronger mix when it cools at night time (e.g. to help prevent tip burn in lettuce).

The user can define when “day” starts and ends and this does not have to align in with actual day time (e.g. you can set day to start at 11am and end at 3:30pm).

Note: The controller can strengthen the mixture by dosing nutrients or weaken by adding water.

5.7.5 Scheduling

If connected via an IntelliLink to Edenic scheduling can be used for setting EC and pH adjustments over the growth period of your plants.

This can be used to change the mix gradually and automatically from vegetative to generative.

Note: On each date specified, the settings change to the new values and then stay at these settings until the next date schedule is reached. Once the last entry is reached the settings just stay at those values permanently.

5.8 Dosing Lockout

Dosing may be locked out if any of the following conditions are detected.

- EC is measured less than 0.1 or greater than 6
- pH is measured less than 4.5 or greater than 8

6.0 Irrigation

IntelliDose provides the ability to control up to 4 irrigation stations with an optional master pump.

If a master pump is selected, this output will run each time any of the station outputs is set to run, to accommodate having a single irrigation pump with each station being watered by opening a solenoid valve.

The irrigation can be specified to operate in “day only” mode or it can have a different interval set for day and night. For example, you could set it to irrigate for 4 minutes every 1 hour during the day and for 4 minutes every 5 hours at night. Alternatively, it can be set to come on once every day at the same time.

This output could be used to operate lighting (instead of irrigation) for indoor crops.

6.1 Irrigation Menu

Irrigation Station 1-4	Irrigation Run time
	Irrigation every OR Irrigation time
	enable / disable Irrigation
	Irrigate during day only (default) or day and night
	Irrigate at the same time each day No (default) / Yes

The menu will dynamically expand if you add more irrigation stations in the Configure > Advanced > Outputs menu.

Each station is assigned its own duration, and control is either:

- **Sequential** - where each station is run in turn (one after the other) all being triggered by a single trigger (day/night interval or time of day)
- **Independent** – where each station is completely independent, each having its own trigger (day/night interval or time of day).

This can be adjusted in the Configure > Advanced > Outputs menu

Irrigations can be manually triggered using the Overrides menu which will have an option for each irrigation station.

6.2 Station settings

Irrigation settings for each station are the following options, each station's settings can be accessed in a similar manner.

Menu setting	Description
Irrig Run Time	Specify how many hours/minutes/seconds the station will run each irrigation event.
Irrigate every Or Irrigate time	If 'Irrigate at same time each day' is NO **Irrigate every** – specify the daytime or nighttime irrigation interval days/hours/minutes If 'Irrigate at same time each day' is YES **Irrigate time**: - specify the time of day to start irrigation
Irrigation Enabled/Disabled	Temporarily enable or disable the station (Note the output remains assigned to this station even if disabled)
Irrigate during	Day only or Day & Night.
Irrigate at:	Irrigation for this station is triggered at a single time of day or triggered using daytime/nighttime interval.

In **Independent Mode** all settings can be different for each irrigation station. In **Sequential Mode** only the run time can be different for each station.

IMPORTANT
The irrigation cycle is taken from the **start** of the cycle. For example, if the interval is 1 hour and duration is 20 minutes and irrigation begins at 6am then irrigations will be:

Irrigation 1 - 6:00am-6:20am
Irrigation 2 - 7:00am-7:20am

6.3 Separate Pump

When using irrigation stations and a **separate pump output** there will be one additional output allocated to the irrigation pump. This allows a single pump drive the irrigation while individual solenoid valves are operated for watering each station. This additional output is labelled as '**Irrig pump**' on the wiring diagram and only needs to be used if using a single irrigation pump.

If individual irrigation pumps are used for watering each station, then it is not necessary to use the Separate pump output.

7.0 Alarms

Setting alarms on your IntelliDose Controller will help warn you when one of your parameters is outside your target range.

7.1 Alarm Menu

Alarm Hold off time	Delay before the system goes into alarm after a trigger has occurred.
EC (Conductivity)	Enter a sub-menu to Enable and set the lower and upper limits for each parameter.
pH	
Temperature	
Dosecount alarm	Disable (default) / enable alarm for the dose count

7.2 Parameter Alarms

For each parameter (Conductivity, pH and Temperature) you will see a sub menu with the below three options.

Alarm disable (default) / enable	Use this to enable or disable alarms for each parameter.
Minimum value	If the controller measures a value **below** the point you set for this it will trigger an alarm
Maximum value	If the controller measures a value **above** the point you set for this it will trigger an alarm

7.3 External Output

To drive an external siren or strobe the external alarm output needs to be enabled in the Configure menu.

Navigate the Menu to Configure > Advanced > Outputs. And enable the Alarm output. Please refer to Edenic for your wiring diagram to learn which output is used for the alarm (it will change depending on your configuration).

8.0 Calibration

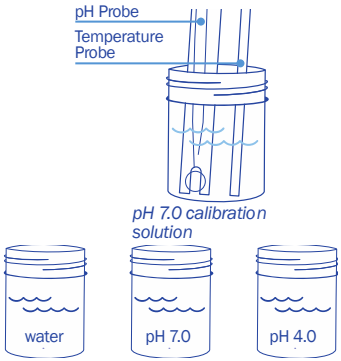
pH calibration is important before first use. It ensures pH measurements and/or pH stock solution dosing is accurate.

For accurate pH readings the pH probe should be cleaned, and calibration carried out when:

- The device is using factory defaults (the calibration indicators are not lit).
- the reading is different to what you were expecting.
- the pH probe is replaced with a new one.

If the pH probe has been in use, it should be cleaned before pH calibration. New pH probes do not need to be cleaned.

8.1 How to perform a pH calibration

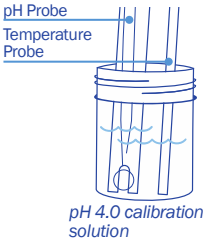
To calibrate the pH	
Clean pH probe tip The pH probe does not require cleaning before the first use.	 *clean the pH probe*
In several separate plastic containers, prepare a small amount of: • fresh tap water • pH 7.0 • pH 4.0 or pH 10.0 calibration solutions.	

pH 7.0 calibration

1. Rinse and place both clean pH and Temperature probe tips in the pH 7.0 calibration solution.
2. Wait a few minutes for the probes to come to the same temperature as the solution.
3. Use the menu and Enter keys to navigate to the Calibrate pH 7 screen.
4. Press the up and down arrows until the reading matches the calibration solution (within +/-0.1).
5. Press “Save” to store the calibration..
6. Now you can calibrate to pH 4.0

pH 4.0 and/or pH 10.0 calibration

1. Rinse both probe tips in fresh tap water, shake off excess water. Place the clean pH probe tip in either pH 4.0 calibration solution.
2. Allow to stand for at least 5 minutes until there is no further change in the pH reading.
3. Use the Menu and Enter keys to navigate to the Calibrate pH 4 screen.
4. Press the up and down arrows to get the calibrated reading to match the calibration solution (within +/-0.1)
5. Press “Save” to save and exit.
6. The pH controller is now calibrated, and ready for use.



The pH probe should be calibrated weekly.

8.2 Conductivity Calibration

To calibrate Conductivity	
Clean the probe tip	Clean the face of the probe. Remove the shroud from the end of the probe and use a little kitchen liquid scouring cleaner such as “Jif" or "SoftScrub” on a **clean** “Scotchbrite” nylon scouring pad. Alternatively, use 600 grit wet-and-dry paper with the cleanser. Use a circular motion to scour the face of the probe and then rinse well in running water. Do not touch the face of the probe with your fingers, shake off any residual water. This care kit makes cleaning your pH probe very easy https://bluelab.com/usa/bluelab-probe-care-kit-conductivity
Place probe into Calibration solution	Replace the shroud and then place in the calibrating solution. The solution supplied has an EC of 2.77mS/cm. To ensure the IntelliDose calibrates properly, you will need to use 2.77mS/cm solution to calibrate. Allow about 5 minutes for the temperature compensation to fully stabilize, press the menu button to reach the Calibration screen, press “Enter” to get to the Calibrate sub-menu, press menu to step through this sub menu until you reach the “Calibrate EC” screen. Press “Enter” to get into the “Calibrate EC screen”.
Adjust calibration and save	Press either the Up or Down arrow keys, to get the calibrated reading to correspond with the Standard calibrating solution (2.77mS/cm,). When this is achieved, press the save button.

The EC probe should be cleaned regularly and calibrated every other week.

8.3 Calibration Tips

For best pH calibration

pH reading accuracy is dependent on the accuracy and age of the calibration solutions used and the use and cleanliness of the pH probe tip.

- Ensure the pH probe has been cleaned and rinse with clean water between calibration solutions to reduce contamination of the pH solutions.
- Only fresh uncontaminated solutions should be used.
- ALWAYS calibrate the pH probe with pH 7.0 then to pH 4.0 and/or pH 10.0.
- Place the temperature probe into the calibration solution with the pH probe during calibration.
- Allow for the pH probe to reach the same temperature as the solution.

Storage and use of calibration solutions

- Always place the lid back onto the bottle after use or evaporation will occur rendering the solutions useless.
- DO NOT measure directly into the bottle. Tip a small amount into a clean container and discard after use.
- Never add water to solutions.
- Store in a cool place.

9.0 Cleaning & Maintenance

9.1 Bluelab pH Probe care

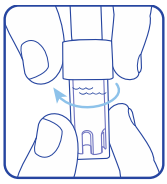
pH probes DO NOT last forever. They age through normal use and will eventually fail. The lifetime of a pH probe depends on the environment it is used in and the way that it is treated.

pH probes contain glass and are therefore FRAGILE.

DO NOT let the pH probe tip dry. IF IT DRIES IT DIES!
DO NOT knock the probe; this will break its internal glass tube or external glass bulb.
DO NOT plunge a cold pH probe into a hot liquid, or a hot probe into cold liquid.
DO NOT immerse in oils, proteins or suspended solids that will leave a coating on the glass bulb.
DO NOT 'kink' or bend the lead sharply.
DO NOT attempt to lengthen the lead on the pH probe.
DO NOT wet the BNC connector at the end of the lead.

Remove pH probe storage cap before use

- Grip the top of the cap and gently twist the base one rotation clockwise to loosen slightly.
- Next slowly slide the cap off the pH probe. DO NOT completely remove the base of the cap from the top of the cap.
- Store the storage cap in a safe place.



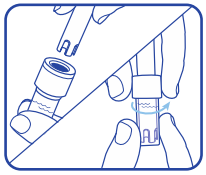
Removing pH probe storage cap

Storing the pH probe

The pH probe tip must be kept moist. To prepare the pH probe for storage, add enough Bluelab pH Probe KCl Storage Solution to the cap so the probe tip is covered. DO NOT use RO (Reverse Osmosis), Distilled or De-ionized water. Pure water changes the chemistry in the reference, causing the probe to die.

If the pH probe has been allowed to dry out;

The pH probe must be 'hydrated' for 24 hours in KCl storage solution. Following this; carry out a calibration to check if the probe has suffered permanent damage.



Ensure probe tip is co vered by the KCl storage solution in cap

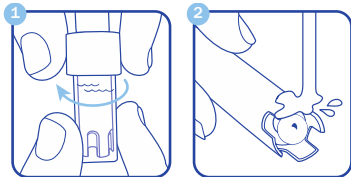
9.2 Cleaning the Bluelab pH Probe

To ensure accurate readings the pH probe tip needs to be rinsed in water and cleaned prior to calibration using the following instructions.
After cleaning, use the probe straight away, or place the storage cap on the probe tip. Always ensure the cap contains enough Bluelab pH Probe KCl Storage Solution to cover the probe tip.

Remove storage cap from pH probe.

Hold the top of the storage cap, twist the cap to loosen then remove.

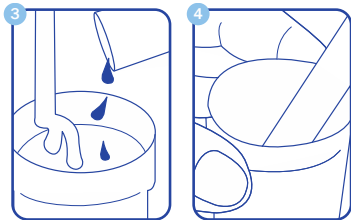
Rinse pH probe tip under fresh tap water.



Fill a small plastic container with clean tap water. Add a small amount of Bluelab pH Probe Cleaner or mild detergent (dishwashing liquid).

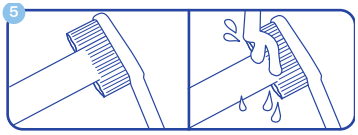
Gently stir the probe tip in the mixture. Ensure that you do not 'knock' the pH probe on the side of the container as this may cause damage to the probe.

Rinse well under fresh running water to remove all traces of the detergent mixture.



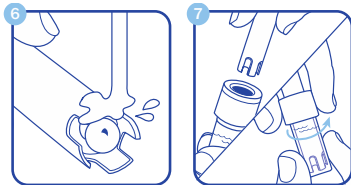
If the probe tip requires removal of heavy contamination:

Gently brush around the glassware with a few drops of Bluelab pH Probe Cleaner or mild detergent (dishwashing liquid) and a soft toothbrush.



Rinse well under fresh running tap water to remove all traces of the detergent mixture.

Calibrate pH probe after cleaning. After calibration use straight away or store pH probe in the storage cap, ensuring there is enough KCl Storage Solution to cover the probe tip.



9.3 Hydrating the pH probe

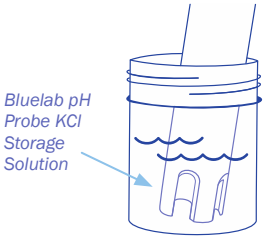
Hydrate the pH probe in Bluelab pH Probe KCl Storage Solution when:
the probe tip has not always been stored in KCl storage solution, to improve the reading response speed.
the probe tip has been accidentally allowed to dry out.
Never store the pH probe in RO (Reverse Osmosis), De-ionized or Distilled water. Pure water changes the chemistry in the reference, causing the probe to die.

Clean the pH probe tip. Ensure the probe tip is cleaned before hydrating.

Add enough Bluelab pH Probe KCl Storage Solution to a plastic container to submerge the pH probe tip.

Loosen, then remove the storage cap (if required). Place the pH probe upright in a the KCl solution.

Leave to soak for up to 24 hours. After hydration, always calibrate the pH probe to ensure accuracy.



9.4 Peristaltic Pumps

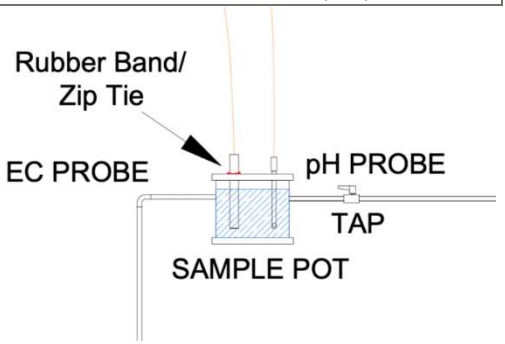
These require very little maintenance. The smaller, 120ml/min peristaltic pumps do not need to be maintained or lubricated.

The larger, 450ml/min & 1.4L/min pumps will need to be lubricated every 3-6 months. You may find you need to replace the internal tubing after some time. The faceplate of the pump is easily removed and the replacement tubing is simple to install. Make sure there are no air leaks in the line to avoid siphoning of the nutrients

10.0 Troubleshooting & FAQ

10.1 Troubleshooting guide

Trouble	Correction
Unit is completely dead i.e. no display, no power light, no outputs.	Check the power pack is functioning, (by measuring with a voltmeter if possible), is plugged in, switched on and properly connected to the controller. If unit still fails to function, the probability is the internal 4A fuse (20mm x 5mm miniature glass fuse) may have blown, likely because the wires connecting the pumps have touched together and shorted out. Inspect all wiring and ensure all wires are well insulated right to the point where they enter the terminal block.
Cannot calibrate pH	Ensure your calibration solution is new and has been stored at room temperature. NEVER reuse calibration solution. If the calibration solution is fine, you will need to replace the pH probe.
EC reading varies from the expected measurement	Ensure there is a small, non-turbulent flow of solution past the face of the EC probe. Ensure probe has been properly cleaned and is free from grease or oil (water should wet the face and should not bead). After cleaning the probe recalibrate it following section 8.2 of this manual.
pH fails to dose	Ensure the controller is set for raise or lower to match the solution used. i.e. if you are using acid (pH down), set the controller to pH lower and ensure the pump is connected to the pH lower output.
pH overdoses	Check the controller is set for pH raise or lower as described above. Also, check the dose time is not excessive. Each dose should change the pH by about 0.1 pH
EC overdoses	Check there is adequate flow through the sample pot and the EC dose time is not excessive. Each dose should change the EC by 0.1 (1CF or 50ppm)
Erratic EC Readings	A possible air bubble in the shroud on your EC Probe. Remove the shroud and use a zip tie or rubber band to hang the probe from the top of the sample pot (see pic), just making sure the bottom of the EC probe does not sit on the bottom of the sample pot.



Returning IntelliDose to factory settings:

1. Remove the power supply from the unit
2. Count to 10
3. Hold down the up and the down arrows to the right of the screen
4. Plug the power supply back into the unit (still holding the arrows)
5. Continue to hold the two buttons until the '*Defaults are loading*' screen disappears.

10.2 Frequently asked questions

Question	Answer
How do I know what each output connection is?	If connected to Edenic, use Edenic to give you a wire diagram based on the current configuration selected.
	The 1-9 outputs get configured in order of what is selected, With Nutrients first, then pH Raise, pH lower, Irrigation Pump, Add water pump, Alarm and lastly Irrigation stations.
How do I manually activate the pumps?	Use the menu option 'Overrides'.

10.3 Controller Menu

Main Menu	Level two	Level three
Dosing	EC (Conductivity) or pH	Setpoint Dosetime Dosing Interval Dosing enable (default) / disable Day/Night EC (default is same)
	Mix % for each nutrient part	
	Dosecount	Dosecount failsafe disable (default) / enable Max doses/hour Max doses/hour Hold-off Time Reset dosecount
Calibration	pH Calibration and EC Calibration	
Overrides	Force EC, pH Lower, pH Raise pumps to turn on for the set dose time.	
Irrigation	Irrigation Station 1-4 The menu will expand if you add more irrigation stations in the Configure > Advanced menu.	Irrigation Run time
		Irrigation frequency OR Irrigation time
		enable / disable Irrigation
		Irrigate during day only (default) or day and night
		Irrigate at the same time each day No (default) / Yes
Alarms	Alarm Hold off time	
	EC (Conductivity) pH	Alarm disable (default) / enable for each parameter
	Dosecount alarm	Disable (default) / enable alarm for the dose count
Clock	Day start (dawn), Day end (Dusk), Set time, Set Date	
Configure	Offline Log Time	
	Nutrient Units	Set conductivity units as EC (Default), CF or TDS)
	Date Format	Set date to be mm/dd/yy or dd/mm/yy
	Temperature Units	Adjust between °F (default) and °C
	Buzzer	Mute or enable (Default) the internal buzzer
	Screen Contrast	Adjust screen contrast to help with visibility
	Backlight	Adjust screen brightness to suit the environment
	Info	Version information for IntelliDose and connected probe.
	Advanced	Dosing type - Simple (default) or Propotional Dosing mode - Sequential (default) or simultaneous Lockouts - Stop the device from dosing if in alarm Configure Outputs • Nutrient Parts (default 2) • pH Output (default Lower) • Irrigation - disable (default) / enable irrigation • Station Outputs - disable (default) / enable. • No. Station Outputs • Station Modes – Independent or Sequential (default) • Water dosing - disable (default) / enable irrigation • Alarms - disable (default) / enable external alarm output

11.0 Specifications

11.1 Technical specifications

Control parameter	pH	Conductivity	Temperature
Units	pH	EC, CF, or TDS (500 ppm)	°C or °F
Measure range	2 to 12 pH	0.1 to 9.9 EC. 1 to 99 CF, 50 to 4,900 ppm	0-50 °C / 32-125 °F
Control range	4.5 to 8.0 pH	0.1 EC to 5.9 EC, 1 to 59 CF, 50 ppm to 2900 ppm	n/a
Fail safe dosing lockout	If pH < 4.5 or > 8.0	If EC < 0.1 or > 6.0	n/a
Resolution	0.1 pH	0.1 EC, 1 CF, 10 ppm	±1 °C (1 °F)
Accuracy at 25°C/77°F	±0.1 pH	+/- 0.1 EC, 1 CF or 50ppm - temperature compensated	±1 °C (2 °F)
Calibration	Two point	(pH 7.0 and pH 4.0, and/or pH 10.0)	
Temperature compensation	Yes (if conductivity probe is in the same solution as pH probe)		
Powered Outputs	9 outputs which can be flexibly configured to operate 1 to 9-part variable ratio nutrient dosing, pH raise, pH lower, Irrigation, add water or alarm The outputs will delivery power based on the input power supply 12-24 V DC or AC. Product is supplied with 24 VDC.		
Operating environment	0 – 45 °C / 32 – 110 °F and not in direct sunlight		
Power supply	Input: 100-240 Vac, 50-60 Hz, With IEC cable for (USA, Euro, UK, NZ/AUS sockets included) Output: 24 VDC 2.5 A		

Power	24VDC, 2.5* A *Current draw depends on number of outputs used, rated at 2.5 A maximum
Screen display languages	English
User Manual languages	English
Certifications	FCC Part 15 Class A, EN55022 Class A, EN61000-4-2/3 (IEC801-2/3), EN55024 and RoHS directive.
Radio Signals	Not Applicable
System Requirements	Requires Android (8.0 or later) or iOS (12 or later) Mobile phone for Edenic Software. Internet connection for remote access & data-logging.
Tubing	Within the Peristaltic Pump – PharMed BPT Supplied as additional - PTFE

Typical Installation Environment	
Moisture exposure	Not IP rated. Indoor installation recommended, outdoor installation should provide protection from moisture ingress via separate enclosure or rain cover.
Altitude	Less than 2000m
Humidity	5-95% relative humidity
Pollution degree of the intended environment	Pollution degree 2

11.2 pH adjuster compatibility for tubing[1]

Bluelab does not recommend the use of highly concentrated acid or alkaline with this product as it is likely to cause damage to the pump tubing. Many leading brands of pH Up and pH Down are appropriate for use without dilution.

As a guide we recommend the following maximum concentration for commonly used acids and alkalines;

	Nutrient tubing LDPE
Nitric Acid	<10%
Phosphoric Acid	<40%
Sulfuric Acid	<50%
Citric Acid	<10%
Potassium Hydroxide	Concentrated
Potassium Carbonate	Concentrated
Potassium Silicate	Concentrated

[1] The chemical concentrations stated in the above table are a guide. Variations in temperature, pressure, or UV exposure may cause tubing failure which could lead to serious injury if proper safety precautions are not followed. For this reason, it is recommended that the tubing be tested with the desired chemical in the specific application to determine suitability. No warranty (neither express or implied) is given that the information in these tables is accurate or complete or that any material is suitable for any purpose.

12.0 Accessories & Warranty

12.1 pH Probe replacement

pH probes do not last forever.
They age through normal use and will eventually fail to calibrate.
To get the most life out of your pH probe, please read the instructions provided with it.

12.2 Probe Care Kits

The instrument is only as accurate as the probe is clean!
Probe cleaning is one of the most important parts of owning and operating any Bluelab meter, monitor or controller.
If the probe is contaminated (dirty) it affects the accuracy of the reading displayed.

Bluelab Probe Care Kit – pH and conductivity contains:	
› Probe care instructions	› Bluelab pH Probe Cleaner
› 3 x plastic cups	› Toothbrush (pH probe cleaning instrument)
› Bluelab Solution Sachets, 2 each of: pH 7.0, pH 4.0 and EC 2.77 Calibration solutions, and KCl storage solution	› Conductivity probe Cleaner
› Chamois for cleaning conductivity probe	

12.3 Peristaltic Pump

Replacement pump motor, cover and tubing is available and quick and simple to replace when required.

12.4 Acid/Alkali Resistant Dosing Tube with Connectors

Replacement inlet/outlet tube - 13 foot / 4 meters.
For use with Bluelab pH Controllers and stock solution.
Dosing tube comes with barbs included to make replacement easy.

12.5 pH Probe KCl Storage Solution

The best solution to store and hydrate your Bluelab pH products. Bluelab pH Probe KCl Storage Solution increases response time and maximizes the life of Bluelab pH probes. Use the KCl solution monthly to hydrate the pH probe after use.

12.6 Bluelab limited warranty

The Bluelab IntelliDose Controller comes with a 2-year limited written warranty (6 months for pH probe). Proof of purchase required.

Bluelab Corporation Limited (Bluelab) provides a limited warranty under the following terms and conditions:

How Long Does Coverage Last?

Bluelab warrants the Bluelab IntelliDose Controller (Product) for a period of 24-months from date of purchase by original purchaser or consumer. Proof of purchase, to Bluelab satisfaction, is required for the warranty to be effective (store sales receipt for Product showing model number, payment, and date of purchase). This warranty is non-transferable and terminates if the original purchaser/consumer sells or transfers the Product to a third party.

What is Covered?

Bluelab warrants the Product against defects in material and workmanship when used in a normal manner, in accordance with Bluelab instruction manuals. If Bluelab is provided with valid proof of purchase (as defined above) and determines the Product is defective, Bluelab may, in its sole discretion either (a) repair the Product with new or refurbished parts, or (b) replace the Product with a new or refurbished Product.

Any part or Product that is replaced by Bluelab shall become its property. Further, if a replacement part or Product is no longer available or is no longer being manufactured, Bluelab may at its sole discretion replace it with a functionally equivalent replacement part or product, as an accommodation in full satisfaction of the warranty.

What is NOT covered?

This warranty does not apply to equipment, component or part that was not manufactured or sold by Bluelab and shall be void if any such item is installed on a Product. Further, this warranty does not apply to replacement of items subject to normal use, wear and tear and expressly excludes:

- Cosmetic damage such as stains, scratches and dents.
- Damage due to accident, improper use, negligence, neglect and careless operation or handling of Product not in accordance with Bluelab instruction manuals, or failure to maintain or care for Product as recommended by Bluelab.
- Damage caused by use of parts not assembled/installed as per Bluelab instructions.
- Damage caused by use of parts or accessories not produced or recommended by Bluelab®.
- Damage due to transportation or shipment of Product.
- Product repaired or altered by parties other than Bluelab® or its authorised agents.
- Product with defaced, missing or illegible serial numbers.
- Products not purchased from Bluelab or a Bluelab-authorised distributor or reseller.

How Do You Get Service?

To begin a warranty claim you must return the Product to the point of purchase with valid proof of purchase (as defined above). You can also return the Product to any Bluelab-authorised distributor or reseller, with valid proof of purchase.

Limitation of Liability & Acknowledgments

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS WARRANTY AND THE REMEDIES SET OUT ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, GUARANTEES AND REMEDIES (ORAL OR WRITTEN, EXPRESS OR IMPLIED).

EXCEPT AS PROVIDED IN THIS WARRANTY AND TO THE MAXIMUM EXTENT PERMITTED BY LAW, BLUELAB IS NOT RESPONSIBLE FOR SPECIAL, INCIDENTIAL OR CONSEQUENTIAL LOSS OR DAMAGES, OR ANY OTHER LOSS OR DAMAGES RESULTING FROM SALE OR USE OF THE PRODUCT, OR BREACH OF WARRANTY, HOWEVER CAUSED, INCLUDING DAMAGES FOR LOST PROFITS, PERSONAL INJURY OR PROPERTY DAMAGE.

IT IS UNDERSTOOD AND AGREED BY CONSUMER UPON PURCHASE OF A PRODUCT THAT, EXCEPT AS STATED IN THIS WARRANTY, BLUELAB IS NOT MAKING AND HAS NOT MADE ANY EXPRESS OR IMPLIED WARRANTY OR OTHER REPRESENTATION REGARDING THE PRODUCT AND DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE TO THE EXTENT PERMITTED BY LAW. ANY WARRANTIES WHICH ARE IMPOSED BY LAW AND CANNOT BE DISCLAIMED ARE HEREBY LIMITED IN DURATION TO THE PERIOD AND REMEDIES PROVIDED IN THIS WARRANTY.

SOME JURISDICTIONS (STATES OR COUNTRIES) DO NOT ALLOW EXCLUSION OR LIMITATION FOR INCIDENTIAL OR CONSEQUENTIAL DAMAGES, OR LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT BE APPLICABLE.

IF ANY PROVISION OF THIS WARRANTY IS JUDGED TO BE ILLEGAL, INVALID OR UNENFORCEABLE, THE REMAINING PROVISIONS OF THE WARRANTY SHALL REMAIN IN FULL FORCE AND EFFECT.

Governing Law; Authority

This warranty is governed by the laws of the state of country where Product is purchased, without regard to its choice of law principles. Except as allowed by law, Bluelab does not limit or exclude other rights a consumer may have with regard to the Product. No Bluelab distributor, employee or agent is authorized to modify, extend, or otherwise change the terms of this warranty.

Register your product online at bluelab.com/product-registration

13. Get in touch

If you need assistance or advice - we're here to help you.
Email: support@bluelab.com

Looking for specifications or technical advice?
Visit us online at bluelab.com or facebook.com/bluelabofficial

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Published 19 November 2023