



# BaseStation 1000 Irrigation Controller User Manual

**September 15, 2015**

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# 1 – Introduction

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Congratulations on choosing the most capable and easiest to use smart irrigation controller in the world! You will find that the BaseStation 1000 is capable of dramatically reducing your water use while improving the health and quality of your landscape when combined with a Baseline soil moisture sensor. The BaseStation 1000 controller will typically pay for itself in one to two seasons based on water waste reduction alone.

The BaseStation 1000 is specifically designed to help you irrigate more efficiently than any other commercial irrigation controller. The BaseStation 1000 and Baseline’s soil moisture sensors measure the effects of evapotranspiration (ET) in the root zone of the plant and then use those readings to water better than weather-based ET systems, and potentially reduce water use by up to 62 percent or more.

At Baseline, our mission is to change the way people water plants by providing the smartest, easiest, and most capable irrigation control products ever made. If you have feedback on how we can make our products better, please do not hesitate to contact us.

**IMPORTANT NOTE!** Install all electrical components including the BaseStation controller in compliance with local electrical and building codes.

## How to Read this Manual

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For first time users, sections 1 through 5 provide an overview of how to get your new BaseStation 1000 controller up and running quickly, while sections 6 through 11 provide information on advanced functions and troubleshooting.

For additional information, you can also visit the Baseline web site at <http://www.baselinesystems.com>

To get the most out of your BaseStation 1000, we recommend that you review the information in this Introduction before you install and configure your system.

## How to Irrigate Efficiently

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This section covers some key concepts that are essential to better and more efficient irrigation. When you irrigate properly, you will reduce or eliminate water waste and improve the health of your plants.

All other considerations being equal, you will see better watering results with soil moisture sensors than with any other currently available technology. When you set up your BaseStation 1000 to water based on soil moisture sensor data, your system becomes a “closed loop” – in other words, the soil moisture sensor directly measures the moisture in the root zone, and the controller adjusts to maintain the desired moisture levels.

- **Water deeply and infrequently.** Studies show that watering deeply and infrequently promotes deeper root growth and more drought tolerant plants.

Watering deeply means that the soil should be wetted down to a depth of 6 inches or deeper for grasses and 12 inches or deeper for trees and shrubs.

Watering infrequently means that the next irrigation event (or start time) should be delayed as long as possible without stressing the plants.

- **Deeper roots = more efficient plants.** Plants with deeper roots are able to draw more nutrients from a larger area of soil, making fertilizers and soil treatments more effective.
- **Avoid runoff.** Matching the application rate of irrigation to the infiltration rate of the soil is critical to avoid runoff.
- **Only apply the amount of water needed.** Irrigation water is a supplement to natural rainfall – you only need to apply the amount of water needed to return the soil to optimum moisture.

Irrigation water applied above the field capacity of the soil is wasted – water will gravitationally sink through the soil below the root zone of the plants.

Unlike other irrigation controllers, the 1000 is specifically designed to make efficient irrigation easy. Before you start setting up and programming your BaseStation 1000, it is helpful to understand the following concepts:

- Soil moisture content
- How to use soil moisture sensors, including how to identify the hydrozones in your landscaping
- Watering strategies
- Root depth and plant water efficiency
- Soak cycling
- Distribution uniformity

The remainder of this section covers these key concepts in more detail.

## Soil Moisture Content

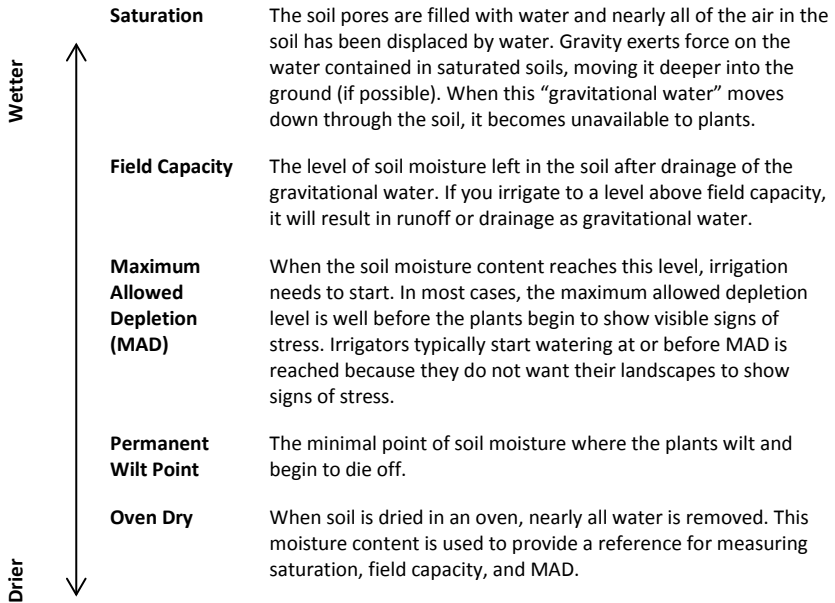
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Soil scientists and agronomists have been studying the plant-water-soil system for over 100 years. Early work in irrigation efficiency focused on the estimation of soil moisture based on weather information, plant water requirements, and soil information such as soil texture and slope. With the availability of inexpensive and highly accurate soil moisture sensors, we are able to take soil moisture based irrigation to a whole new level of efficiency and effectiveness.

With soil moisture sensors, your controller can operate like a thermostat for your landscape – applying water when it is needed, and where it is needed.



To understand soil moisture based smart irrigation, you also need to understand the following industry standard terms for soil moisture content.



One key point is that water applied above field capacity is generally wasted – it gravitationally moves down through the soil and becomes unavailable to plants. Excess water will also leech nutrients from the soil into deeper soil layers, reducing the efficiency of fertilizers and soil treatments.

To understand field capacity, it is often useful to think of a sponge. If you dunk a sponge in a bucket of water and pull it out, water will gravimetrically drain from the sponge for a period of time. When the dripping stops, the sponge will still be very wet. This moisture level is roughly equivalent to field capacity in soils – water is no longer draining into lower soil layers and is held in the root zone of the plants.

When your irrigation system maintains soil moisture content between field capacity and maximum allowed depletion, you will find that your plants are healthier and your water use actually decreases. Studies also show that appropriately varying the time between irrigation events in order to allow the soil to dry to the chosen depletion point promotes deeper root growth and subsequently more efficiency and drought tolerance from the plants.

## How to Use Soil Moisture Sensors Successfully

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The first key for success with soil moisture sensors is to identify the hydrozones that exist in your landscaping. A hydrozone is a grouping of plants that have similar water usage and delivery characteristics and can be watered the same. For example, each of the following landscaping areas is a separate hydrozone:

- Grass in full sun with rotors
- Grass in full sun with sprays
- Drip zones in full sun
- Grass in shade with rotors
- Grass in shade with sprays
- Drip zones in shade

With a BaseStation 1000 (base model), you can install up to 10 soil moisture sensors, and then you associate each sensor with a program.

In order to get the most benefit from your soil moisture sensors, Baseline recommends that you identify the hydrozones in your landscaping, determine which irrigation zones are used to water those hydrozones, and then consider how you can “group” the irrigation zones based on their common characteristics.

**Note:** In the BaseStation 1000, you group zones by setting up runtimes for the related zones in a single program. Then make sure that those zones do not have runtimes in any other programs. Refer to Setting Up Zone Runtimes for a Program on page 36.

For example, you can group zones that:

- Require irrigation on the same frequency (for example, on the same days)
- Have similar plant types (such as zones that water turf, shrubs, or trees)
- Do not have excessive differences in sun or wind exposure
- Are irrigated with similar water application technologies (assuming zones meet the criteria above)  
You can group spray, rotor, and multi-stream zones, as long as the application rate varies less than 10%. You can also put drip zones into one group, and subsurface drip zones into another group.

After you have grouped your zones, install one soil moisture sensor in a representative area for each group.

Consider the following example of a sports park that has four baseball fields and four soccer fields in addition to some perimeter and parking lot shrub areas.

The irrigation manager for the park wants to water the infield areas of the baseball fields differently from the outfields. The manager puts the zones that water the infields of all four baseball diamonds into one program that is monitored by a single soil moisture sensor in one of the infields.

Likewise, the manager puts all zones covering the outfields into a second program monitored by a single moisture sensor in one of the outfields.

Because all the soccer fields have similar plant types and sun exposures, the irrigation manager can put all zones for all the soccer fields in one program and monitor them with a single soil moisture sensor located in one of the fields.

Lastly, the irrigation manager breaks the parking lot and perimeter shrub beds into two groups representing sunny and shady exposures.

In this way, the irrigation manager is able to configure 42 individual zones into 5 groups that are monitored by 5 soil moisture sensors and watered by 5 different programs.

## Choosing the Sensor Location

You will achieve the best results by locating the biSensor in an area that is average for the zone and ideally for the entire group. Avoid the following areas:

- Drainage areas where irrigation or rainwater pools or is channeled
- Areas immediately around hardscapes or that receive runoff water from hardscapes or buildings

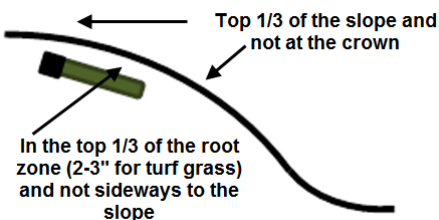
As long as the location of the sensor is average for the zone, you should achieve excellent water efficiency.

### *Dealing with Slopes and Berms*

Steep slopes and berms are possibly the most difficult landscape areas to irrigate efficiently. The main issue is runoff, but often subsurface drainage issues result in low areas that get soaking wet and high areas that are bone dry. When a berm is constructed, the central mass is typically compacted, which can also cause water movement and drainage issues.

Soil moisture sensors are an excellent tool to optimize watering for slopes and berms because the sensor can detect how much irrigation water is actually infiltrating the upper levels of the slope or berm.

Take care when you set the soak and cycle times for slopes and berms – for some slopes, you might need to break the total runtime into five or more cycles.



### ***Optimal biSensor Placement for Slopes and Berms***

If the slope or berm is irrigated as a part of a larger zone that is mostly level, Baseline recommends that you place the sensor in the larger level area. However, for most efficient results, set up separate zones to water the top, middle, and bottom of slopes and berms.

### **Burying the biSensor**

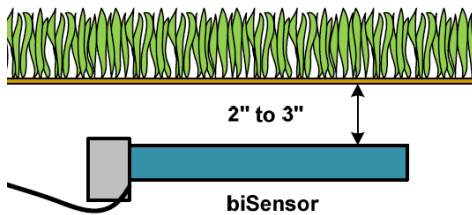
Install the biSensor according to the installation instructions that are included with it. When installing a biSensor in an established landscape, avoid disturbing the surrounding soil in order to reduce the chance that adjustments will be needed later.

In general, you should install the biSensors in the top 1/3 of the root zone for the plant that is being irrigated. In the case of turf grass, the top of the sensor blade should be 2 inches to 3 inches from the bottom of the thatch layer.

**Note:** Burying the moisture sensor too deep can cause poor results. If the sensor is deeper than the top 1/3 of the root zone, these roots can become too dry and the plants may become stressed.

### ***Turf Grass***

As previously stated, you should bury the sensor 2 inches to 3 inches below the thatch layer, or in the top 1/3 of the root zone of the grass.



### ***Newly Seeded Turf Grass or New Sod***

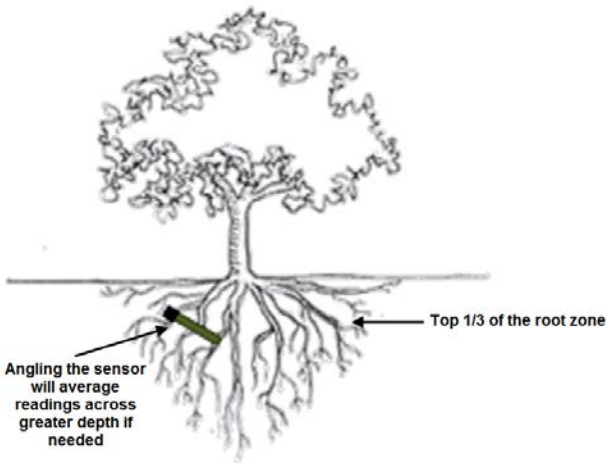
The default watering strategies for the 1000 are intended to optimize water efficiency for established plants and turf. This style of watering can result in poor performance for newly seeded turf.

If you want to install a sensor in newly seeded turf grass, follow the installation instructions and bury the sensor at the proper depth. Baseline recommends that you water according to an appropriate timed schedule until the grass has rooted sufficiently (typically 60 to 90 days) before enabling a sensor based watering strategy. After the grass has rooted, you can convert the zone to a sensor based watering strategy.

Likewise, newly installed sod has very shallow roots. Water the new sod on an appropriate time schedule until it has rooted sufficiently to enable a sensor based watering strategy (typically 30 to 60 days).

## *Trees and Shrubs*

If trees and shrubs are watered separately, a moisture sensor is an excellent tool to maintain their health and beauty. Typically, multiple trees are watered by the same zone. If so, choose an average tree, and install the biSensor in the top 1/3 of the root zone of the tree.



### **biSensor in the top 1/3 of the root zone of an established tree**

Angling the sensor can monitor a deeper soil profile for trees that have deep root structures.

If the tree is watered with drip emitters or bubblers, install the sensor in a location that is not directly under the emitter or bubbler to avoid partial watering of the whole root zone of the tree. If multiple emitters are used for a single tree, a good rule of thumb is to install the sensor roughly half way between two emitters and as much inside the root mass of the tree as possible without damaging the roots.

**Note:** Root depth and water requirements for trees and shrubs vary much more greatly than for turf. Consult an experienced Arborist or Master Gardener for specific guidelines for watering trees.

Most trees are watered along with turf in commercial landscapes. In this case, Baseline recommends that you install biSensors in the turf areas and that you adjust the default runtimes of zones with trees to ensure water application to 12 inches or whatever is required to optimize tree health.

### ***Installing biSensors with New Trees***

In the case of new landscape with newly installed trees that are watered separately from turf zones, it is important to make sure that the sensor is located as close to the root ball in the top 1/3 of the root ball as possible. Watering new trees with a sensor based watering strategy is a good way to avoid inadvertently "drowning" new trees and shrubs due to overwatering.

### ***Shrubs and Other Ornamental Plants***

Many landscapes feature shrub zones that are separately watered from turf zones. Shrubs generally have very different water needs from turf, so having separate zones is a good thing!

For shrub zones, choose a representative plant, and then install the in or close to the top 1/3 of the root zone for the plant, without damaging the root structure of the plant.

If drip emitters or bubblers are used, install the sensor in a location that is not directly under the emitter or bubbler to avoid partial watering of the whole root zone of the plant.

### ***Gardens and Crop Plants***

Sensors are excellent tools for maximizing crop results. They have been used for decades in irrigated agriculture.

Garden and crop plant watering depends greatly on the type of plants being grown, and a discussion of this topic is beyond the scope of this manual.

To plan a watering strategy for larger gardens or crops, Baseline recommends that you contact your local Cooperative Extension Office. You can find a national register of the extension offices at: <http://www.csrees.usda.gov/Extension/>

### ***Root Depth and Plant Water Efficiency***

Studies show that most plants, in particular standard turf grasses, do not grow deeper roots unless prompted to do so. While some turf grass varieties rapidly grow deeper root structures when properly watered, even Kentucky bluegrass will grow roots in excess of 12 inches in appropriate soil textures when it is watered optimally.

Watering deeply and infrequently on a consistent basis will promote healthier plants with deeper root structures. As roots grow deeper, the plants are then able to access water in deeper and typically wetter soil layers, making them even more water efficient. Plants with deeper roots are also able to draw nutrients and fertilizers from deeper soil layers, making the plants more nutrient efficient as well.

## **Watering Strategies**

Each property is unique and has unique watering requirements. In order to support a broad range of climate zones, plant types, landscape designs, and landscape usage requirements, the BaseStation 1000 provides a variety of watering strategies.

The basic watering strategies supported by the 1000 are shown in the following table.

Timed	Like all irrigation controllers, you can program the 1000 to run zones on specific times and dates. Timed irrigation is the default setting for any zone that has not been associated with a moisture sensor. Refer to Setting Up Zone Runtimes for a Program on page 36.
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Smart Interval	The BaseStation 1000 allows you to set the days between irrigation according to a historical ET calendar for your area. This watering strategy, unlike typical seasonal adjustments, will promote deeper root growth and healthier plants throughout the season. However, historical ET based watering will not protect your landscape from unusual weather patterns in any given season. Read the topic about Setting a Start Condition for a Program on page 37.
Start When Less Than Limit	In this soil moisture based, smart watering strategy, irrigation is suspended or skipped until the soil dries below the lower limit, which is set manually or automatically through calibration. This watering strategy naturally waters deeply and infrequently and promotes deeper root growth in plants. The controller will water for a specified runtime each time it is allowed to water. When you are using this watering strategy, remember to ensure that ½ inch or more of water is applied frequently enough to water sufficiently during the hottest period of the season. Refer to the topic on Setting a Moisture Start Condition on page 39.
Stop When Greater Than Limit	In this soil moisture based, smart watering strategy, irrigation events are scheduled for specific times and dates, but the total runtime is adjusted by the controller to bring soil moisture up and very slightly over field capacity. This watering strategy is particularly useful for landscapes that need to be at a desired moisture level on a regular schedule, such as sports fields or heavy use parks. On these types of properties, damage to turf takes place when the soil is either too wet or too dry. Refer to the topic on Setting a Stop Condition for a Program on page 49.

One of the most common irrigation programming mistakes is to apply too little water during the hottest days of the season. Baseline recommends that, regardless of watering strategy, you program each zone to water long enough to put down at least ½ inch of water each time the controller is allowed to water.

For suggestions on programming your controller for these moisture sensor based watering strategies, refer to Tips for Setting Up Common Configurations on page 103.

## Other Uses for Moisture Sensors

In addition to using moisture sensors to monitor the amount of moisture in the soil, you can also use moisture sensors to monitor the level of water in a pond or cistern and then automatically start or stop a program based on the water level.

When you are using the moisture sensor to start/stop a program based on the amount of water in a pond or cistern, you will typically set the following start/stop conditions for the program:

Start When Greater Than Limit	The program will start when the pond/cistern fills to a certain level and the moisture sensor detects that the water level is greater than the specified limit. Refer to the topic on Setting a Moisture Start Condition on page 39.
Stop When Less Than Limit	The program will stop when the pond/cistern is drained to a certain level and the moisture sensor detects that the water level is less than the specified limit. Refer to the topic on Setting a Stop Condition for a Program on page 49.

## Understanding Soak Cycling

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When you set up your irrigation programs, remember that the rate at which the irrigation application devices apply water might be very different than the rate at which the soil in your landscape can take up that water.

Soak cycling breaks the total runtime into shorter water “cycles” with “soak” periods in between to allow time for water to soak into the soil.

### Precipitation Rates vs. Infiltration Rates

The precipitation rate, which is the rate at which sprinkler heads or drip emitters apply water to the soil, is typically measured in inches, like rainfall.

Many soils only allow water infiltration at a rate of .25 inch per hour or less, whereas most head types put down .50 inch per hour or more (much more in the case of some spray heads).

Also remember that head spacing and overlap directly influence the total precipitation rate for any specific zone.

### Examples of Precipitation Rates for Common Sprinkler Types

Spray Heads	1.00 inch to greater than 5.00 inches per hour
Gear Driven Rotors	0.25 inch to 0.65 inch per hour
Multi-stream Rotors	0.40 inch to 0.60 inch per hour
Drip Emitters	Depends on area covered, rarely exceeds infiltration rate

### Estimated Infiltration Rates for Common Soil Types

Course Sand	0.75 inch to 1.00 inch per hour
Fine Sand	0.50 inch to 0.75 inch per hour
Fine Sandy Loam	0.35 inch to 0.50 inch per hour
Silt Loam	0.15 inch to 0.40 inch per hour
Clay Loam	0.10 inch to 0.20 inch per hour

As you can see from the tables above, most sprinkler heads have higher precipitation rates than the infiltration rate of most soils.

When the irrigation schedule puts down more water than the soil can take up, the excess water will typically run off to the lowest point, leaving some areas of the landscape, or even the entire irrigated landscape, under watered. Standing water also evaporates at a fairly high rate, especially in the heat of the summer months, further reducing irrigation efficiency.

Even on a perfectly designed system, it is important to match the water application rate to the infiltration rate of your soil. You can achieve this balance by breaking a total runtime for any zone into multiple “cycles” (timed water applications) and “soaks” (timed wait periods, which will allow the water applied in the last cycle to infiltrate into the soil before more water is applied).



The BaseStation 1000 has built-in support for soak cycling and has intelligent watering algorithms that apply cycles in the optimal order to maximize water penetration and minimize evaporation loss.

As a rule-of-thumb, Baseline recommends that you break the total runtime for any zone into at least 3 cycles, and configure the soak time between cycles to be at least twice the length of the cycle time.

**Note:** One easy way to determine good cycle times is to turn a zone on and watch for first signs of standing water or runoff. Set the cycle time to be no more than this amount of time.

Properly setting soak and cycle times will dramatically improve water penetration and watering efficiency.

## Intelligent Soak Cycles™

In addition to traditional soak cycling, Baseline's controllers allow you to enable Intelligent Soak Cycles for a program. As in traditional soak cycling, the Intelligent Soak Cycle breaks the total runtime into periods of watering interspersed with periods of soak times; however, Intelligent Soak Cycles prioritize runtimes for zones that have already started to water over zones that have not started in order to maximize watering efficiency and minimize total irrigation time.

When you have many zones in a program, traditional soak cycles will ignore soak time settings while the program waters each zone for the allotted time. For example, a program has 10 zones. The runtime is 30 minutes with 3 soak cycles. You set the soak time for 20 minutes. The first zone waters for 10 minutes and then each successive zone waters for 10 minutes. By the time all 10 zones have watered, zone 1 will have been soaking for approximately 100 minutes. When Intelligent Soak Cycles are enabled, the controller checks after each zone has run to determine whether any previous zones are done soaking. If a soak time is finished, the controller waters the previous zone again.

## Using Soak Cycles with Soil Moisture Sensors

When you are using a soil moisture sensor to start or stop programs, you need to understand how the soak cycle settings will affect your system.

- If you set a program to start when the soil moisture sensor reading is less than the limit, you should set up at least 3 soak cycles with a soak time that is at least twice as long as the cycle time, and enable Intelligent Soak Cycles.
- If you set a program to stop when the soil moisture sensor reading is greater than the limit, you should set up at least 3 soak cycles, but DO NOT enable Intelligent Soak Cycles because this setting could cause the program to stop before all zones have finished watering.
- If you want to maintain moisture within a narrow range, DO NOT use soak cycles.
- If you want to maintain moisture within a broader range, you should set up at least 3 soak cycles, but DO NOT enable Intelligent Soak Cycles.

## Distribution Uniformity

---

Distribution uniformity (DU) refers to how evenly water is applied over the area in a particular zone or landscape. This is generally driven by the choice of heads (such as spray, rotor, or multi-stream) and by the irrigation design.

In reality, it is common for distribution uniformity to be poor in irrigated landscapes. Poor distribution uniformity is based on many factors beyond the scope of this manual, but it is important to note that system problems such as uneven coverage will limit the effectiveness of smart watering strategies.

Baseline's experience is that high-uniformity systems can be built from nearly any head type, as long as it is properly designed, installed and maintained.

**IMPORTANT NOTE!** The BaseStation 1000 controller can compensate for, but cannot solve, distribution uniformity problems.

As you intelligently reduce water applied to any zone, you may notice stressed areas or brown spots in your landscape. When this happens, you should first adjust your heads to make coverage as even as possible. In extreme cases, you may find it advantageous to retrofit older heads with new types of heads such as multi-stream rotors that apply water more evenly.

**Note:** Fixing distribution uniformity issues has better long term results than increasing runtimes or moisture settings.

Every irrigation controller must be programmed to water to the "driest spot" in each zone. If the difference between water applied at the driest spot is too great (especially if the wettest spot has more than 3 times the water applied in the same period as to the driest spot) then you should take steps to adjust your heads, their spacing, and their coverage to gain better uniformity.

You can quickly and easily measure the distribution uniformity of your landscape by placing catch cups in any particular zone and then running that zone for a specific period of time. Auditing zones in this manner will also give you precise information about how much water is applied per hour in that zone, which makes it easy to set default runtimes. Baseline highly recommends that you audit zones in order to determine uniformity and actual application rates.

## Complying with Water Restrictions

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There are times and seasons when water restrictions are placed on areas. Keeping a green and healthy landscape during these restrictions is best achieved with deep rooted turf! Train your grass before the crisis to grow deep roots by watering deeply and only when the grass needs it.

**Note:** If you are in an area that is under severe water restrictions, do not try to water using biSensors – set the water strategies to Timed and apply permitted water.

The first step in understanding how to keep the controller from watering when it should not is to identify under what conditions it will allow watering. The BaseStation 1000 controller will start a program when all of the following conditions have been met:

- Program start time

- Valid water day
- If a moisture biSensor is used, then the moisture level at the program start time is less than the limit
- There isn't a pause condition
- There isn't a stop condition

The program will run to completion, spanning days if needed. The running program may be paused for some period of time by one of the following conditions, after which it will resume until it has completed:

- A water window that is turned off (indicated by  on the Water Windows screen)
- An activated event switch or event biCoder
- Putting the controller in a programming menu or the Test menu rather than in the Run menu

If there are specific days that cannot be used for watering, use one of the following methods to meet those requirements:

- Start programs after midnight and provide enough time for them to complete during a single day so they do not span into the next day.
- Use water windows to block out specific days.

## How the BaseStation 1000 Handles ET Watering

---

ET (evapotranspiration) refers to the loss of moisture from the soil by evaporation and by the transpiration of water from plants. Factors such as air temperature, humidity, solar radiation, and wind speed affect the rate at which ET occurs. Many companies claim that their irrigation controllers water better because they are based on ET data gathered from local weather stations. While this approach may be better than strict time-based watering, it bases plant water needs on ET estimates rather than on the actual effects of ET in the plants' root zone.

The BaseStation 1000 and Baseline's soil moisture sensors actually measure the effects of evapotranspiration (ET) in the root zone of the plant and use those readings to water more efficiently than weather-based ET systems, and potentially reduce water use by up to 62 percent or more.

However, if you prefer to set up a watering schedule for the entire year that compensates for seasonal changes without having to adjust times and frequency multiple times throughout the year, you can use the Smart Interval option within the Day & Time start conditions for a program. Bear in mind that a smart interval based watering schedule works best in regions where landscapes are irrigated all year. Refer to the topic about setting a Day and Time start condition on page 37.

The best way to set up smart intervals is to refer to the historical ET deficit data for your region that are generated for each month of the year. Scientists with the National Oceanic and Atmospheric Administration (NOAA) continuously monitor climate data in all regions of the United States. They average this data over a 30 year period to come up with the historical ET deficit data for your region.

## Recommendations

- Set zone runtimes that will apply ½ inch of water during each watering cycle.
- Get the historical ET deficit data for your region. Consult with your local Agricultural Cooperative Extension office – you can find a national register of the extension offices at: <http://www.csrees.usda.gov/Extension/>
- Split each month of the year in half and determine how frequently you will need to water in order to replace, but not exceed, the amount of moisture used by your plant material since the last irrigation event. Use the ET deficit data to determine the watering frequency.

## 2 – System Components

This section covers the components, devices, and communication options that are available for the BaseStation 1000 irrigation controller. Review this information to learn about how many devices are supported and how to install your enclosure.

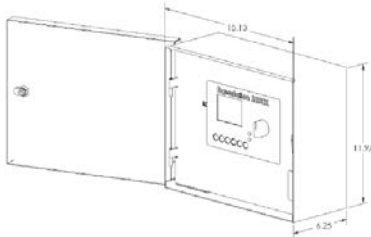
### Cabinet Options

Your BaseStation 1000 will be installed in one of the following cabinets:

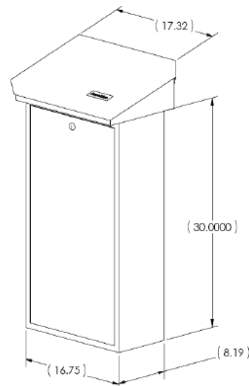
All cabinets are constructed from 16 gauge steel.

- **X-series** – Powder-coated (X) or stainless steel (XS) indoor/outdoor wall mount cabinet
- **P-series** – Stainless steel pedestal cabinet

**X/XS-series**



**P-series**



**All cabinet dimensions are in inches (in).**

Follow the instructions in the installation guide that came with the enclosure.

## Remote Communication Options

---

The BaseStation 1000 supports the following remote communication options:

- Cellular Modem
- Wireless Ethernet (Wi-Fi)
- Ethernet Radio

**Note:** To install the remote communication devices, refer to the instructions included with the device.

## Remote Access and Central Control Options

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The BaseStation 1000 comes equipped with LiveView. With a special expansion module, the controller is also compatible with remote access and central control through Baseline's BaseManager.

### LiveView™

LiveView allows you to remotely operate the controller from a computer or other web-enabled device. The BaseStation 1000 provides the following methods for using LiveView:

**Note:** LiveView is not supported over a cellular modem connection.

- **LiveView over a local area network (LAN)** – If you can connect an Ethernet cable between your controller and a live Ethernet port on your local area network, you can use Local LiveView on a computer or other web-enabled device that is connected to the same network. To connect to Local LiveView, refer to Setting Up the Web Server for Local LiveView on page 72.
- **LiveView over the Internet** – If your network has Internet access and you can connect an Ethernet cable between your controller and a live Ethernet port, you can use Internet-based LiveView to make your controller accessible at anytime from anywhere, with any Internet-accessible device, just as if you were standing in front of it. The LiveView interface is available through Baseline's BaseManager server on the Internet. To connect to Internet-based LiveView, refer to Setting Up the Default Network Connection on page 70.

**Note:** Unless you purchase the BaseManager expansion module, you will have only limited access to BaseManager features through LiveView.

## BaseManager™

BaseManager is a powerful cloud-based central control and remote access platform that allows any BaseStation 1000 controller to be managed remotely over the Internet. With BaseManager, you'll be able to do everything you normally have to do at the controller, from the convenience of any Internet connected device.

In order for a BaseStation irrigation controller to connect to BaseManager, the controller must have access to the Internet. Every BaseStation 1000 controller has a built-in Ethernet port that is Internet ready. You can also connect the controller to the Internet through with one of the other supported communication options.

To enable full support for all BaseManager features on the BaseStation 1000, you need to purchase and install a BaseManager expansion module.

**Note:** Your organization can also run BaseManager on a self-hosted server.

Refer to Enabling the BaseManager Connection on page 74.

The following resources are available on Baseline's website ([www.baselinesystems.com](http://www.baselinesystems.com)).

- BaseManager Quick Start Guide
- BaseManager Online Help

## Two-Wire Devices

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The BaseStation 1000 can communicate with all of the following Baseline accessories:

- One, two, and four valve biCoders
- 12, 24, 36, and 48 zone 5200R series powered retrofit biCoders
- biSensor soil moisture sensors
- PFS series smart PVC flow sensors
- BHM series hydrometers – metal-body flow meter and master valve combination
- Flow sensor biCoders for connection to third-party flow sensors and master valves
- Event biCoder – compatible with any standard normally closed pause device such as a rain switch or a wind switch
- Air temperature biCoder
- Event switch (also called a “coach's button”)
- Pump start biCoder

## Total Supported Devices and Limits

The following table lists the total numbers of devices by type that can be connected to a BaseStation 1000. The BaseStation 1000 can communicate with a maximum of 110 device loads on the two-wire path within the layout and length limits outlined later in this section.

Two-Wire Device Type	Base Model Total	Device Loads
Valve biCoders	50	½ per biCoder
5200R series biCoders	20	2 per biCoder
biSensors	10	1
Master Valves/Pump Starts	1	1
Flow Meters	1	3
Event Switches	3	1

You can configure 50 zones in the 1000 or 1000R controller. Unused ports or serial numbers on biCoders do not occupy a zone address and do not count towards the 50 zone limit.

### *Memory Expansion Modules for the BaseStation 1000*

The BaseStation 1000 can be upgraded to support up to 100 zones, 3 points of connection, 40 programs, and 20 sensors. The BL-1000MEXP-BM expansion module provides full support for BaseManager. You can add up to 2 expansion modules to your BaseStation 1000. Refer to Adding Expansion Modules on page 84.

Total Supported Devices	Base Model	With the BL-1000MEXP-25	With the BL-1000MEXP-50
Zones	50	75	100
Programs	20	30	40
Moisture Sensors	10	15	20
Water Sources	1	2	3
Event Switches	3	5	7



### Maximum Concurrent Valves

The maximum number of concurrently operating valves is shown in the two tables below. The number of concurrent valves varies based on the total load count and wire length to the farthest device:

Maximum Concurrent Valves -#12 Wire							Maximum Concurrent Valves -#14 Wire					
Wire Length (ft)							Wire Length (ft)					
biCoder and Sensor Load Count	1000-3000	4000	5000	6000	7000	8000	biCoder and Sensor Load Count	1000	2000	3000	4000	5000
	100	15	14	13	8	6		4	100	13	11	8
90	15	15	14	9	7	5	90	14	12	9	5	3
80	15	15	15	10	8	6	80	15	12	10	6	4
70	15	15	15	11	9	7	70	15	13	11	7	5
60	15	15	15	12	10	8	60	15	14	12	8	6
50	15	15	15	13	11	9	50	15	15	13	9	7
40	15	15	15	14	12	10	40	15	15	14	10	8
30	15	15	15	15	13	11	30	15	15	15	11	9
20	15	15	15	15	14	12	20	15	15	15	12	10
10	15	15	15	15	15	13	10	15	15	15	13	11

### Maximum Wire Distances for 5200R Series biCoders

#### Maximum Wire Distance Between Powered biCoder and Valve (ft)

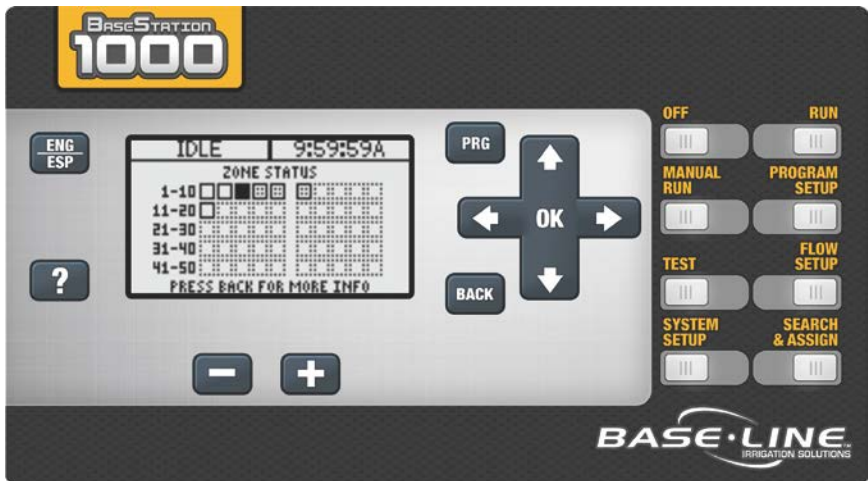
Common Wire #	Valve Wire # (gauge)						
	18	16	14	12	10	8	6
18	800	1000	1200	1300	1400	1500	1500
16	1000	1300	1600	1900	2100	3200	2400
14	1200	1600	2100	2600	3000	3400	3700
12	1300	1900	2600	3300	4100	4800	5400
10	1400	2100	3000	4100	5400	6600	7600
8	1500	2300	3400	4800	6600	8700	10500
6	1500	2400	3700	5400	7600	10500	13300

Moisture sensors can communicate over valve wire distances equal to ½ the values on this chart to a maximum distance of 1500 ft.

## 3 – The BaseStation 1000 Interface

Review this section to get familiar with the layout of the BaseStation 1000 interface. This information covers the components of the front panel, the On-Screen Help, the features of the main screen, as well as the zone status icons.

### Controller Front Panel Layout



**Display** – The display indicates the current state of the controller and is used to program the controller. Refer to Setting Up the Screen Display on page 77 for information about improving image quality in outdoor conditions including direct sunlight and low light.

**Main Menu Buttons** – The buttons are used to select the various operating or programming menus of the controller. An indicator light glows on the button for the menu that is active.

**Buttons** – The buttons are used to select programming elements, change their values, and initiate operations like testing a zone.

**ENG/ESP** Switch between the English and the Spanish interface on the controller

**?** Display help for any screen

**+** Increase the value of the highlighted field, or sequences through the available options in the selected field

- Decrease the value of the selected field, or sequences through the available options in the selected field

**PRG** Select the program that you want to modify

**Arrow Buttons** Move within a screen

↑↓←→

**OK** Select an option or perform an action

**BACK** Return to a previous screen or cancel an action

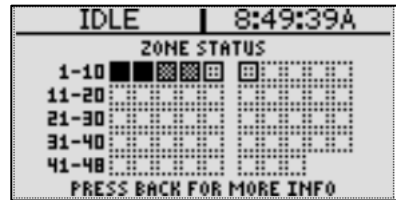
## On-Screen Help

Press the ? button at any time to display the On-Screen Help. When the help displays, press the ↓ button to scroll through the text, and when you have finished using the help, press the ? button or the **BACK** button to return to the previous screen.

## Zone Status Report




When the controller is in the RUN menu, the Zone Status report typically displays on the screen.






If you do not see “ZONE STATUS” and the list of zones, press the RUN button to make sure that the controller is in the RUN menu, and then press the BACK button to display the Status Report menu. Select the Zone Status option from the menu.



## Understanding Zone Statuses

The following icons identify the status of the zones:

Icon	Status	Description
	Unassigned	The zone does not have a biCoder assigned to it
	Done	The complete cycle has finished for this zone – including watering and soaking
	Waiting	The zone is scheduled to run, but currently it is not watering or soaking

	Watering	Watering is in progress
	Soaking	The zone has watered and is now soaking
	Paused	A pause condition is in effect for this zone
	Disabled	The zone is marked as being disabled
	Message	There is a message associated with this zone

## BaseManager Message

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If you connect your controller to the Internet in order to use Internet-based LiveView™, the controller connects to the BaseManager server. The server detects the connection and checks for an associated account. If no account is found, the server sends an authorization/registration PIN to your controller. You might see the PIN displayed on the controller's main screen as illustrated here. You will use the PIN to create your BaseManager account. Refer to Using Internet-based LiveView to Remotely Operate the Controller on page 77.



After you create your BaseManager account, this message no longer displays on the controller.

## 4 – Configuring Devices

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After you have finished connecting all your devices, you need to have the controller find those devices so you can assign them.

The devices that you can attach to the BaseStation 1000 have serial numbers. The controller identifies an attached device by its serial number. After you have searched for the attached devices, you can assign each serial number to a specific purpose in the controller. For example, you map a valve biCoder's serial number to the number or address of the zone that the valve waters.

The base model of the BaseStation 1000 controller accommodates up to 50 zones, and those zones are identified in the controller with numbers 1 to 50. These numbers are also referred to as "addresses" because they tell the controller where a specific device "lives."

Before you can configure any devices such as biCoders or biSensors in the controller, the controller must find those devices, and then you must assign them. You can connect the following types of biCoders and other two-wire devices directly to the two-wire path:

- Valve biCoders (decoders)
- Master valve and pump start biCoders
- biSensors (soil moisture sensors)
- Flow biCoders
- Event switch biCoders
- Air temperature sensors

### Searching for and Assigning biCoders (including Powered biCoders)

---

1. Press the **Search & Assign** button. The Search & Assign menu displays.
2. If the **Zone** option is highlighted, press the **OK** button to select it. If Zone is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Zone screen displays.
3. If the **Device Assignment** option is highlighted, press the **OK** button to select it. If Device Assignment is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Zone Assignment screen displays.
4. When the **Search** option in the Action column is highlighted, press the **OK** button to search for biCoders.

When the controller finds the devices, their serial numbers display in the Action column.

5. Press the **↑** or **↓** button to move through the list of devices in the Action column. Highlight the serial number of the device that you want to assign to a zone.
6. Press the **⇒** button to move to the Zone column.
7. Press the **↑** or **↓** button to move through the list of zones. Highlight the zone that you want to assign the device to.
8. Press the **OK** button to select the highlighted zone. The serial number of the device that you selected in the Action column now displays next to the zone number in the Zone column.
9. Continue until you have assigned all your biCoders to their zones.

Zone Assignment	
ACTION	ZONE
E012472	
D003329	
0006641	1-None
0006642	2-None
0006643	3-None

**Note:** The next serial number in the Action column is automatically highlighted. Press the **↑** or **↓** button in the Zone column to move to the next zone that you want to assign, and then press the OK button.

## Setting Up Zones

After you assign a device to a specific use in the BaseStation 1000 system, the device is automatically enabled. You can disable that device if you want to take it out of service temporarily, and then you can enable it again when necessary.

You can also manually set the flow rate for each zone.

1. Press the **Search & Assign** button. The Search & Assign menu displays.
2. Press the **↑** or **↓** button to highlight the **Zone** option, and then press the **OK** button to select it. The Zone screen displays.
3. Press the **↑** or **↓** button to highlight the **Device Setup** option, and then press the **OK** button. The Zone Device Setup screen displays.
4. Press the **↑** or **↓** button to highlight in the left column the number of the zone that you want to change settings for, and then press the **⇒** button to move to the **Enabled** field.
  - If the device is currently enabled, a **checkmark displays** in the Enabled field. Press the **+** or **-** button to remove the checkmark.
  - If the device is currently disabled, **there is no checkmark** in the Enabled field. Press the **+** or **-** button to replace the checkmark.
5. Press the **↓** button to move to the **Flow Rate** field.

Zone Device Setup	
	Enabled: <input checked="" type="checkbox"/>
	Flow Rate: 0.00gpm
1	Drive Level: Read?
2	
3	
ZONE 1	

6. Press the + or – button to change the gallons per minute (gpm) for the zone.  
**Note:** To rapidly increase or decrease the value, press and hold the + button or the – button.
7. Press the ↓ button to move to the **Drive Level** field.  
**Note:** Refer to Changing the Drive Level for a Device on page 25.
8. Continue until you have configured the settings for all your zones.

## Changing the Drive Level for a Device

---

If you have a solenoid on your system that turns on but does not stay on, you might need to adjust the drive level for the biCoder that is connected to that zone. You can adjust the drive level value from a minimum of 1 to a maximum of 3 to accommodate for solenoids with different power requirements.

1. Navigate to the **Zone Device Setup** screen by following the instructions in the Setting Up Zones topic on page 24.
2. Press the ↓ button to move to the **Drive Level** field.
3. Press the **OK** button to read the current drive level of the device.
4. When the number displays in the Drive Level field, press the + or – button to change the setting.  
**Note:** Number 1 is the minimum drive level and 3 is the maximum.
5. Continue until you have changed the drive level for all devices as needed.

## Searching For and Assigning Master Valve and Pump Start biCoders

---

1. Press the **Search & Assign** button. The Search & Assign menu displays.
2. Press the ↑ or ↓ button to highlight the **MV/Pump** option, and then press the **OK** button to select it. The MV/Pump screen displays.
3. If the **Device Assignment** option is highlighted, press the **OK** button to select it. If Device Assignment is not highlighted, press the ↑ or ↓ button to highlight it, and then press the **OK** button. The MV/Pump Assignment screen displays.
4. When the **Search** option in the Action column is highlighted, press the **OK** button to search for master valve or pump start biCoders.

When the controller finds the devices, their serial numbers display in the Action column.

5. Press the ↑ or ↓ button to move through the list of devices in the Action column. Highlight the serial number of the device that you want to assign to a master valve or pump start.
6. Press the ⇒ button to move to the MV/Pump column.

- Press the **↑** or **↓** button to move through the list. Highlight the MV/Pump number that you want to assign the device to.

- Press the **OK** button to select the MV/Pump number. The serial number of the device that you selected in the Action column now displays next to the number in the MV/Pump column.

MV/Pump Assignment	
ACTION	MV/PUMP
Search	1-D003329
Unassign	2-None

**Note:** If the search found multiple devices, the next serial number in the Action column is automatically selected. Press the **↑** or **↓**

button in the MV/Pump column to move to the next number that you want to assign, and then press the **OK** button.

- Continue until you have assigned all your MV/pump start biCoders to their numbers.

## Setting Up Master Valves/Pumps

After you assign a device to a specific use in the BaseStation 1000 system, the device is automatically enabled. You can disable that device if you want to take it out of service temporarily, and then you can enable it again when necessary.

- Press the **Search & Assign** button. The Search & Assign menu displays.
- Press the **↑** or **↓** button to highlight the **MV/Pump** option, and then press the **OK** button to select it. The MV/Pump screen displays.
- Press the **↑** or **↓** button to highlight the **Device Setup** option, and then press the **OK** button. The MV/Pump Device Setup screen displays.
- Press the **↑** or **↓** button to highlight the MV/Pump number in the left column, and then press the **⇒** button to move to the **Enabled** field.
  - If the device is currently enabled, a **checkmark displays** in the Enabled field. Press the **+** or **-** button to remove the checkmark.
  - If the device is currently disabled, **there is no checkmark** in the Enabled field. Press the **+** or **-** button to replace the checkmark.
- Press the **↓** button to move to the **Normally Open** field. If you want this device to allow water in the pipes at all times, press the **OK** button to put a checkmark in this field. If you want to configure the device as Normally Closed, leave the field blank.
- Press the **↓** button to move to the **Drive Level** field. Press the **OK** button to read the current drive level of the device.
- When the number displays in the **Drive Level** field, press the **+** or **-** button to change the setting. You can enter a number between 1 and 3.
- Continue until you have configured the settings for all your master valve and pump devices.



## Searching For and Assigning Soil Moisture Sensors (biSensors)

---

1. Press the **Search & Assign** button. The Search & Assign menu displays.
2. Press the **↑** or **↓** button to highlight the **Moisture Sensor** option, and then press the **OK** button to select it. The Moisture Sensor screen displays.
3. If the **Device Assignment** option is highlighted, press the **OK** button to select it. If Device Assignment is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Moisture Assignment screen displays.
4. When the **Search** option in the Action column is highlighted, press the **OK** button to search for soil moisture sensors.

When the controller finds the devices, their serial numbers display in the Action column.

5. Press the **↑** or **↓** button to move through the list of devices in the Action column. Highlight the serial number of the soil moisture sensor that you want to assign.
6. Press the **⇒** button to move to the Moisture Sensor column.
7. Press the **↑** or **↓** button to move through the list. Highlight the number that you want to assign the soil moisture sensor to.
8. Press the **OK** button. The serial number of the device that you selected in the Action column now displays next to the number in the Moisture Sensor column.

**Note:** If the search found multiple devices, the next serial number in the Action column is automatically selected. Press the **↑** or **↓** button in the Moisture Sensor column to move to the next number that you want to assign, and then press the **OK** button.

9. Continue until you have assigned all your soil moisture sensors to their numbers.

## Setting Up Moisture Sensors

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After you assign a device to a specific use in the BaseStation 1000 system, the device is automatically enabled. You can disable that device if you want to take it out of service temporarily, and then you can enable it again when necessary.

1. Press the **Search & Assign** button. The Search & Assign menu displays.
2. Press the **↑** or **↓** button to highlight the **Moisture Sensor** option, and then press the **OK** button to select it. The Moisture Sensor screen displays.
3. Press the **↑** or **↓** button to highlight the **Device Setup** option, and then press the **OK** button. The Moisture Device Setup screen displays.
4. Press the **↑** or **↓** button to highlight the moisture sensor number in the left column, and then press the **⇒** button to move to the **Enabled** field.
  - If the device is currently enabled, a **checkmark displays** in the Enabled field. Press the **+ or -** button to remove the checkmark.

- If the device is currently disabled, **there is no checkmark** in the Enabled field. Press the + or – button to replace the checkmark.
5. Press the ↓ button to highlight the **Zone** field.
  6. Press the + or – button to move through the list of zones, and then stop when the zone that you want to associate the moisture sensor with displays in the field.
  7. Continue until you have configured the settings for all your moisture sensors.

**Note:** The BaseStation 1000 records the soil moisture sensor data in a graph. Refer to Viewing Moisture Graphs on page 91.

## Searching For and Assigning Flow biCoders

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1. Press the **Search & Assign** button. The Search & Assign menu displays.
2. Press the ↑ or ↓ button to highlight the **Flow Sensor** option, and then press the **OK** button to select it. The Flow Sensor screen displays.
3. If the **Device Assignment** option is highlighted, press the **OK** button to select it. If Device Assignment is not highlighted, press the ↑ or ↓ button to highlight it, and then press the **OK** button. The Flow Assignment screen displays.
4. When the **Search** option in the Action column is highlighted, press the **OK** button to search for flow biCoders.

When the controller finds the devices, their serial numbers display in the Action column.

5. Press the ↑ or ↓ button to move through the list of devices in the Action column. Highlight the serial number of the flow biCoder that you want to assign.
6. Press the ⇌ button to move to the Flow Sensor column.
7. Press the ↑ or ↓ button to move through the list. Highlight the number that you want to assign the flow biCoder to.
8. Press the **OK** button. The serial number of the device that you selected in the Action column now displays next to the number in the Flow Sensor column.

**Note:** If the search found multiple devices, the next serial number in the Action column is automatically selected. Press the ↑ or ↓ button in the Flow Sensor column to move to the next number that you want to assign, and then press the OK button.

9. Continue until you have assigned all your flow biCoders to their numbers.

## Setting Up Flow biCoders

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After you assign a device to a specific use in the BaseStation 1000 system, the device is automatically enabled. You can disable that device if you want to take it out of service temporarily, and then you can enable it again when necessary.

You can also set the K-Value for the flow device.

1. Press the **Search & Assign** button. The Search & Assign menu displays.
2. Press the **↑** or **↓** button to highlight the **Flow Sensor** option, and then press the **OK** button to select it. The Flow Sensor screen displays.
3. Press the **↑** or **↓** button to highlight the **Device Setup** option, and then press the **OK** button. The Flow Device Setup screen displays.
4. Press the **↑** or **↓** button to highlight the flow device number in the left column, and then press the **⇒** button to move to the **Enabled** field.
  - If the device is currently enabled, a **checkmark displays** in the Enabled field. Press the **+** or **-** button to remove the checkmark.
  - If the device is currently disabled, **there is no checkmark** in the Enabled field. Press the **+** or **-** button to replace the checkmark.
5. Press the **↓** button to move to the **K-Value** field.

**Note:** The K-Value is a calibration factor for a flow device expressed in pulses per unit volume. The K-Value is used to calibrate the volumetric throughput of a flow device. Manufacturers give the K-Value (or K-Factor) of their flow device in the device specification.

  - If the device is a Baseline flow biCoder, the correct K-Value automatically displays in the field. Press the **+** or **-** button to change the K-Value if necessary.
  - If the device is not a Baseline flow biCoder, you need to enter the K-Value manually. Find the K-Value for the device in the manufacturer's documentation, and then press the **+** or **-** button to enter the number in the K-Value field.
6. Continue until you have configured the settings for all your flow devices.

## Searching For and Assigning Event Switch Devices

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1. Press the **Search & Assign** button. The Search & Assign menu displays.
2. Press the **↑** or **↓** button to highlight the **Event Switch** option, and then press the **OK** button to select it. The Event Switch screen displays.
3. If the **Device Assignment** option is highlighted, press the **OK** button to select it. If Device Assignment is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The E. Switch Assignment screen displays.
4. When the **Search** option in the Action column is highlighted, press the **OK** button to search for switch devices.

When the controller finds the devices, their serial numbers display in the Action column.
5. Press the **↑** or **↓** button to move through the list of devices in the Action column. Highlight the serial number of the switch device that you want to assign.
6. Press the **⇒** button to move to the Event Switch column.
7. Press the **↑** or **↓** button to move through the list. Highlight the number that you want to assign the switch device to.

8. Press the **OK** button. The serial number of the device that you selected in the Action column now displays next to the number in the Event Switch column.

**Note:** If the search found multiple devices, the next serial number in the Action column is automatically selected. Press the **↑** or **↓** button in the Event Switch column to move to the next number that you want to assign, and then press the OK button.

9. Continue until you have assigned all your switch devices to their numbers.

## Setting Up Event Switches

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After you assign a device to a specific use in the BaseStation 1000 system, the device is automatically enabled. You can disable that device if you want to take it out of service temporarily, and then you can enable it again when necessary.

1. Press the **Search & Assign** button. The Search & Assign menu displays.
2. Press the **↑** or **↓** button to highlight the **Event Switch** option, and then press the **OK** button to select it. The Event Switch screen displays.
3. Press the **↑** or **↓** button to highlight the **Device Setup** option, and then press the **OK** button. The E. Switch Device Setup screen displays.
4. Press the **↑** or **↓** button to highlight the switch device number in the left column, and then press the **⇒** button to move to the **Enabled** field.
  - If the device is currently enabled, a **checkmark displays** in the Enabled field. Press the **+** or **-** button to remove the checkmark.
  - If the device is currently disabled, **there is no checkmark** in the Enabled field. Press the **+** or **-** button to replace the checkmark.
5. Continue until you have configured the settings for all your event switch devices.

## Searching For and Assigning Air Temperature Sensors

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1. Press the **Search & Assign** button. The Search & Assign menu displays.
2. Press the **↑** or **↓** button to highlight the **Temperature Sensor** option, and then press the **OK** button to select it. The Temperature Sensor screen displays.
3. If the **Device Assignment** option is highlighted, press the **OK** button to select it. If Device Assignment is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Temp. Assignment screen displays.
4. When the **Search** option in the Action column is highlighted, press the **OK** button to search for air temperature sensors.

When the controller finds the devices, their serial numbers display in the Action column.

5. Press the **↑** or **↓** button to move through the list of devices in the Action column. Highlight the serial number of the air temperature sensor that you want to assign.
6. Press the **⇒** button to move to the Temp. Sensor column.

7. Press the **↑** or **↓** button to move through the list. Highlight the number that you want to assign the air temperature sensor to.
8. Press the **OK** button. The serial number of the device that you selected in the Action column now displays next to the number in the Temp. Sensor column.

**Note:** If the search found multiple devices, the next serial number in the Action column is automatically selected. Press the **↑** or **↓** button in the Temp. Sensor column to move to the next number that you want to assign, and then press the OK button.

9. Continue until you have assigned all your air temperature sensors to their numbers.

## Setting Up Air Temperature Sensors

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After you assign a device to a specific use in the BaseStation 1000 system, the device is automatically enabled. You can disable that device if you want to take it out of service temporarily, and then you can enable it again when necessary.

1. Press the **Search & Assign** button. The Search & Assign menu displays.
2. Press the **↑** or **↓** button to highlight the **Temperature Sensor** option, and then press the **OK** button to select it. The Temperature Sensor screen displays.
3. Press the **↑** or **↓** button to highlight the **Device Setup** option, and then press the **OK** button. The Temp. Device Setup screen displays.
4. Press the **↑** or **↓** button to highlight the switch device number in the left column, and then press the **⇒** button to move to the **Enabled** field.
  - If the device is currently enabled, a **checkmark displays** in the Enabled field. Press the **+** or **-** button to remove the checkmark.
  - If the device is currently disabled, **there is no checkmark** in the Enabled field. Press the **+** or **-** button to replace the checkmark.
5. Continue until you have configured the settings for all your air temperature sensors.

## Unassigning a Device

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After you have assigned a device, you might need to reassign that device for another purpose, or, in the case of assigned zones, you might need to reorder your zone numbers.

1. Press the **Search & Assign** button. The Search & Assign menu displays.
2. Press the **↑** or **↓** button to highlight the option for the device that you want to unassign, and then press the **OK** button.
3. Highlight the **Device Assignment** option, and then press the **OK** button. The Assignment screen for the selected device displays.
4. In the left column, press the **↓** button to highlight the **Unassign** option.
5. Press the **⇒** button to move to the right column.

6. In the right column, press the **↑** or **↓** button to highlight the device that you want to unassign, and then press the **OK** button. The device serial number moves into the left column and the previously assigned number in the right column displays “None.”
7. Press the **BACK** button to return to the Search & Assign menu.

## 5 – Programming the Controller

After you have configured your devices as described in the previous section, you are ready to start the initial programming on your BaseStation 1000 controller. Review the information in this section to learn how to set up time-based watering for your zones, how to enable the soak cycles, and set up your programs. If you are using a soil moisture sensor, be sure to read the information about setting up soil moisture sensor based watering including the information about the watering strategies.

### Restarting the Controller

If the controller goes into an abnormal state and does not respond, you might need to restart it. Typically, we recommend that you call Baseline Support (866.294.5847) before you restart the controller.

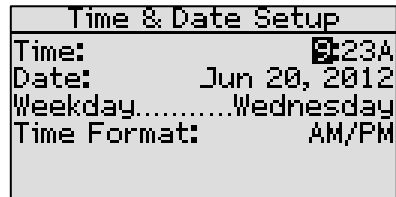
1. Press the **OFF** button.
2. Press and hold the **ENG/ESP** and **?** buttons for approximately 5 seconds.
3. After the screen goes blank, release the buttons. The controller restarts automatically.
4. Press the **RUN** button. The controller displays the Zone Status screen.

### Setting the Controller Date and Time

Set or change the controller date and time to match the current date and time. If the controller is connected to BaseManager, the time will be automatically set by the server.

**WARNING!** Changing the date and time can cause watering events to be missed.

1. Press the **System Setup** button. The System Maintenance menu displays.
2. The **Time & Date Setup** option should be highlighted. If it is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Time & Date Setup screen displays.
3. In the **Time** field, notice that the hours placeholder is highlighted.
  - To change the time, press the **+** or **-** button.
  - To move to the minutes placeholder, press the **⇒** button.



4. Press the **↓** button to move to the **Date** field.
  - Press the **←** or **→** button to move to the date field that you want to change.
  - Press the **+** or **-** button to change the value in the field.
5. Press the **↓** button to move to the **Weekday** field, and then press the **+** or **-** button to change the value in the field.
6. Press the **↓** button to move to the **Time Format** field, and then press the **+** or **-** button to change the value in the field. This field enables you to switch the time format between AM/PM and 24 hour settings.

**Example:**        In AM/PM format    10:00A and 10:00P  
                      In 24 hour format    10:00 and 22:00
7. When you have finished making changes, press the **RUN** button.

## Checking the Firmware Version on Your Controller

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Firmware upgrades are free for the life of any Baseline controller as long as the hardware is compatible. Baseline will periodically release firmware upgrades that enhance the usefulness of our products or fix the occasional bug.

To determine whether the firmware version on your controller is different from the currently released version, go to the Baseline web site ([www.baselinesystems.com](http://www.baselinesystems.com)). Click **Support**, and then click **Firmware Version Updates**. Click the link for the BaseStation 1000. Review the information on that page, to find out what the current firmware version is and then compare that with the version on your controller.

If you find that an updated firmware version is available and you want to replace the firmware on your controller with the new version, refer to Updating the Firmware on the Controller on page 82.

1. Press the **System Setup** button. The System Maintenance menu displays.
2. Press the **↓** button to highlight the **Firmware Update** option and then press the **OK** button. The Firmware Update screen displays.
3. The **USB Update** option should be highlighted. If it is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The USB Update screen displays. The controller firmware version is listed at the top of the screen.



**Note:** To update the firmware, refer to Updating the Firmware on the Controller on page 82.



## Setting Up Programs

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The BaseStation 1000 supports up to 40 programs. The controller identifies each program with a number starting at 1 and going up to 40. In the BaseStation 1000, you set up all watering by programs.

In the BaseStation 1000, a program provides the schedule for when the associated zones will water. The program has the following components:

**Zone Runtimes** – A runtime is the total amount of time that the zone is scheduled to water. The runtime may or may not occur all at once depending on whether you have soak cycles set up.

All zones are available to all programs, but zones are not assigned runtimes by default.

To associate a zone with a program, select that program and set a runtime for the specific zone.

**Start Conditions** – The BaseStation 1000 has a variety of options for starting a program. You can set up the program to start on a specified day and time with various interval options. You can set up the program to start based on soil moisture sensor readings, on the condition of a switch, or on a specified temperature.

**Seasonal Adjustment** – If your area is experiencing a period of unseasonably dry or wet weather, you can use the seasonal adjustment factor to increase or decrease the amount of water that a program is applying without having to change the runtimes for individual zones.

**Soak Cycles** – You can break a program runtime into several soak cycles in order to prevent runoff or evaporation. You decide how many cycles you want and set the amount of time the water will be allowed to soak in.

The controller manages the cycle time for each zone and for all the zones in a program based on the number and duration of soak cycles and the zone runtimes that you have set.

**Water Windows** – Water windows are used to select when watering will or will not be allowed. You can configure water windows on a weekly basis (having the same water window settings for each day of the week) or on a daily basis, where you can set each day of the week for a specific water window schedule.

**Zones at one Time** – The BaseStation 1000 manages the number of zones that can run at the same time by program.

**Pause Conditions** – You can configure a program to pause based on soil moisture sensor readings, on the condition of a switch, or on a specified temperature.

**Stop Conditions** – You can configure a program to stop based on soil moisture sensor readings, on the condition of a switch, or on a specified temperature.

**Master Valves, Pump Starts, and Water Sources** – You associate these items with a specific program in order to control the flow of water in your system.

## Setting Up Zone Runtimes for a Program

A runtime is the total amount of time that the zone is scheduled to water. The runtime may or may not occur all at once depending on whether you have soak cycles set up. You associate a zone with a program by giving the zone a runtime in that program.

In the BaseStation 1000, you group zones by setting up runtimes for the related zones in a single program. Then make sure that those zones do not have runtimes in any other programs.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

3. The **Zone Runtimes** option should be highlighted. If it is not highlighted, press the ↑ or ↓ button to highlight it, and then press the **OK** button. The Zone Runtimes screen displays. Zones are identified with a sequential number and by the serial number of the attached biCoder.

4. Notice that the minutes placeholder in the **Zone 1** field is highlighted.

Prg 1	Zone Runtimes
1-E012471:	0:30:00
2-E012472:	0:30:00
3-0006641:	0:30:00
4-0006642:	0:30:00
5-0006643:	0:30:00
<b>ZONE 1</b>	

- To move to the hour placeholder, press the ← button.
- To move to the seconds placeholder, press the → button.
- To change the time, press the + or – button.

**Note:** To rapidly increase or decrease the value, press and hold the + button or the – button.

- To move to a different zone, press the ↑ or ↓ button.
5. When you have finished setting up all the zone runtimes for one program, do one of the following:
    - To set up zone runtimes for another program, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.
    - To continue setting up other components of the program, press the **BACK** button to return to the Program Setup menu, where you can select the next item that you want to set up.
    - To exit Program Setup, press the **RUN** button.

## Setting a Start Condition for a Program

In the BaseStation 1000, a program is not active until you select a start condition for it. The system provides the following start conditions:

- **Day and Time Start** – You can set a variety of start days and up to eight start times in a 24 hour period. If there is no start time, then the program is considered to be OFF or disabled and no watering will be allowed on the zones of that program.
- **Moisture Start** – When the start condition for your program is based on moisture, the BaseStation 1000 takes a reading from the soil moisture sensor that is associated with the program and starts the program based on the settings in this start condition.
- **Event Switch Start** – When the start condition for your program is based on switch state, the BaseStation 1000 evaluates the state of the event switch that is associated with the program and starts the program based on the settings in this start condition.
- **Temperature Start** – When the start condition for your program is based on temperature, the BaseStation 1000 takes a reading from the air temperature sensor that is associated with the program and starts the program based on the settings in this start condition.

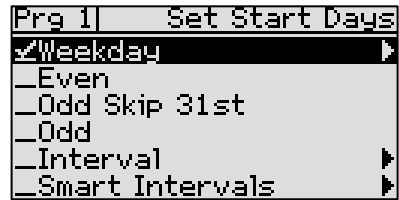
**IMPORTANT NOTE!** If you have the required devices attached to your controller, you can apply all of the start conditions to a program. On the Setup Prg. Start screen, select each option to display a checkmark next to it, and then set up the conditions for each option. The start conditions operate independently, which means that programs will be started when one start condition is met and they will start again when another start condition is met.

### *To Set a Day and Time Start Condition*

**Note:** Be sure to use the Day and Time Start with new grass. After the root zone is established, you can change to one of the other start conditions.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.  
**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.
3. Press the ↓ button to highlight the **Setup Prg. Start** option, and then press the **OK** button. The Setup Prg. Start screen displays the list of start conditions.  
**Note:** If you want the controller to display a message whenever a program starts, refer to Enabling Start, Pause, and Stop Messages on page 90.
4. Press the ↓ button to highlight the **Day & Time Start** option, and then press the **OK** button. A checkmark displays next to the Day & Time Start option.
5. Press the ⇒ button to go to the Day & Time Start menu.

6. Press the **↓** button to highlight the **Set Start Days** option, and then press the **OK** button. The Set Start Days screen displays.



7. Press the **↓** button to highlight one of the following options, and then press the **OK** button:

- **Weekday** – After you select the Weekday option, press the **⇒** button to set up the weekdays when you want the program to start. By default, the boxes for the days of the week are marked with a checkmark, which indicates that the program will start every day. If you want to change a start day setting, press the **⇒** button to select the day, and then press the **OK** button to change the setting.
- **Even** – Select Even to start the program only on the even numbered days of the month.
- **Odd Skip 31<sup>st</sup>** – Select Odd Skip 31<sup>st</sup> to start the program only on the odd numbered days of the month, but skip the 31<sup>st</sup> day in order to maintain an every-two-day schedule when crossing to a new month.
- **Odd** – Select Odd to start the program only on the Odd numbered days of the month.
- **Interval** – After you select the Interval option, press the **⇒** button to set up a custom day interval. Press the **+ or –** button to change the number in the Day Interval field.
- **Smart Interval** – After you select the Smart Interval option, press the **⇒** button to set up the intervals for each half month. The calendar displays boxes that represent the months of the year. The numbers in the boxes represent the day intervals for first half and second half of the month. Press the **⇒** button to move to the box where you want to change the interval, and then press the **+ or –** button to change the number in the box.

**Note:** The Smart Interval based watering schedule works best in regions where landscapes are irrigated all year. Baseline recommends that you use the historical ET deficit data for your region to configure the intervals. To find the historical ET deficit data for your region, consult with your local Agricultural Cooperative Extension office – you can find a national register of the extension offices at: <http://www.csrees.usda.gov/Extension/>

8. Press the **BACK** button to return to the Day & Time Start menu.
9. Press the **↓** button to highlight the **Set Start Times** option, and then press the **OK** button. The Set Start Times screen displays.

**Note:** Each active program must have at least one start time. Programs that have no start times will not run.

10. Press the **↓** button to highlight the box for the start time that you want to change.
11. Press the **+ or –** button to change the number in the box.

**Note:** To rapidly increase or decrease the number, press and hold the **+** button or the **–** button.

12. Press the **RUN** button to exit Program Setup.

## To Set a Moisture Start Condition

Baseline's biSensor moisture sensor is a reliable device for measuring moisture levels in the root zone of plants and then sending that data to the controller. You can set a moisture start condition for a program that will cause the program to start based on a specified soil moisture reading. You can also use a moisture sensor to monitor the level of water in a pond or cistern and then automatically start a program based on the water level.

For suggestions on programming your controller for a moisture start condition, refer to Tips for Setting Up Common Configurations on page 103.

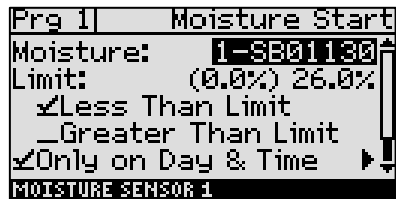
**Note:** To use a moisture start condition, you must have one or more soil moisture sensors installed and assigned. Refer to Searching for and Assigning Soil Moisture Sensors on page 27.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

3. Press the **↓** button to highlight the **Setup Prg. Start** option, and then press the **OK** button. The Setup Prg. Start screen displays the list of start conditions.
4. Press the **↓** button to highlight the **Moisture Start** option, and then press the **OK** button. A checkmark displays next to the Moisture Start option.
5. Press the **⇒** button to configure the moisture start settings.

6. Notice that the serial number for one of your soil moisture sensors is highlighted in the **Moisture** field. If this is the serial number for the sensor installed in the area that this program will water, no change is required. If you need to assign a different soil moisture sensor to the program, press the + or – button to select a different serial number.



7. Press the **↓** button to highlight the **Limit** field, and then perform one of the following:
  - To manually set the limit, press the + or – button to change the number in the field. Depending on how you are using the moisture sensor, this number represents either the upper or lower limit.
  - To have the controller set the limit based on a calibration, leave the default settings in the Limit field, and then enable the calibration as described in step 10 below.

**Note:** In the Limit field, the value in parentheses is the most current reading from the soil moisture sensor. Keep in mind that the sensor is read every 10 minutes.

8. Press the **↓** button to highlight one of the following start settings, and then press the **OK** button:

Setting	Monitoring Soil Moisture Levels	Monitoring Pond/Cistern Levels
<b>Less Than Limit</b> (Lower Limit/ Lower Threshold)	Use this option to <b>START</b> the program when the soil moisture is less than the number in the Moisture Limit field.  With this condition, you can set the limit with a calibration cycle.	Use this option to <b>STOP</b> the program when the water level in the pond or cistern is less than the number in the Moisture Limit field. Refer to Setting a Stop Condition for a Program on page 49.
<b>Greater Than Limit</b> (Upper Limit/ Upper Threshold)	Use this option to <b>STOP</b> the program when the soil moisture is greater than the number in the Moisture Limit field. Refer to Setting a Stop Condition for a Program on page 49.	Use this option to <b>START</b> the program when the water level in the pond/cistern is greater than the number in the Moisture Limit field.  You cannot use a calibration cycle to set the limit for this condition.

9. If you want the moisture start condition to run only on specific days and times, press the **↓** button to highlight **Only on Day & Time**, and then press the **OK** button to display a checkmark next to the option. Press the **⇒** button to configure the start days and start times. Refer to the procedure for Setting the Day and Time Start Condition on page 37.

**Note:** When you use this setting to associate the day and time start with the soil moisture start condition, the program starts when both the day/time and the moisture condition has been met. When you have an additional start condition set, such as Interval or Smart Interval, these settings will control the next start time. Be aware that watering can be delayed by these additional start conditions.

10. Press the **↓** button to highlight the **Calibration** field. This field only displays when you select the Less Than Limit.

- If the calibration has not been enabled, the Start? option displays on the right side of the screen. To start the calibration, highlight the **Start?** option, and then press the **OK** button.
- If the calibration has been enabled, the Stop? option displays on the right side of the screen. To stop the calibration, highlight the **Stop?** option, and then press the **OK** button.

**Note:** When you enable calibration, the process either starts immediately or at the next day and time start. The program puts down 150% of the required water and then waits for 24 hours. The calibration reading is taken when the soil moisture is at field capacity. After the calibration cycle runs one time, it is disabled in the controller.

11. Press the **RUN** button to exit Program Setup.

### To Set an Event Switch Start Condition

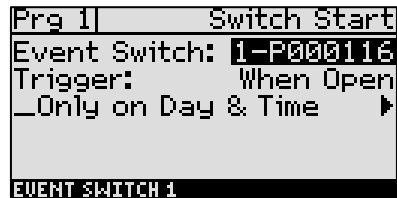
**Note:** To use a switch start condition, you must have one or more event switch devices installed and assigned.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

3. Press the ↓ button to highlight the **Setup Prg. Start** option, and then press the **OK** button. The Setup Prg. Start screen displays the list of start conditions.
4. Press the ↓ button to highlight the **E. Switch Start** option, and then press the **OK** button. A checkmark displays next to the E. Switch Start option.
5. Press the ⇒ button to configure the switch start settings.

6. Notice that the serial number for one of your switch devices is highlighted in the **Event Switch** field. If this is the serial number for the switch device installed in the area that this program will water, no change is required. If you need to assign a different switch device to the program, press the + or – button to select a different serial number.



7. Press the ↓ button to highlight the **Trigger** field, and then press the + or – button to alternate between “When Open” and “When Closed” to indicate which switch condition will cause your program to start.

**Example:** You have a rain switch that uses hydroscopic discs to detect rain and halt watering. When the discs dry out, the switch opens and allows the system to water again. In this example, you would set the program start condition for the switch to “When Open.”

8. If you want to combine the switch start condition with a day and time start, press the ↓ button to highlight **Only on Day & Time**, and then press the **OK** button to display a checkmark next to the option. Press the ⇒ button to configure the start days and start times. Refer to the procedure for Setting the Day and Time Start Condition on page 37.
9. Press the **RUN** button to exit Program Setup.

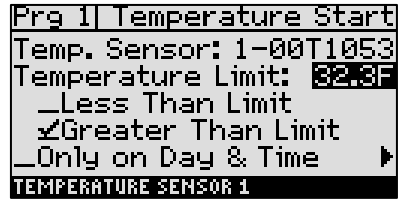
### To Set a Temperature Start Condition

**Note:** To use a temperature start condition, you must have one or more air temperature sensors installed and assigned.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

3. Press the ↓ button to highlight the **Setup Prg. Start** option, and then press the **OK** button. The Setup Prg. Start screen displays the list of start conditions.
4. Press the ↓ button to highlight the **Temperature Start** option, and then press the **OK** button. A checkmark displays next to the Temperature Start option.
5. Press the ⇒ button to configure the temperature start settings on the Temperature Start screen.



6. Notice that the serial number for one of your air temperature sensors is highlighted in the **Temp. Sensor** field. If this is the serial number for the sensor installed in the area that this program will water, no change is required. If you need to assign a different air temperature sensor to the program, press the + or – button to select a different serial number.
7. Press the ↓ button to highlight value in the **Temperature Limit** field, and then press the + or – button to change the value in degrees Fahrenheit.
8. Press the ↓ button to highlight one of the following start options, and then press the **OK** button:

**Note:** If a checkmark displays on one of the start options, but you want to use a different option, press the ↓ button to highlight the other option and then press the **OK** button. The checkmark is removed from the originally selected option, and it displays on the newly selected option.

- **Less Than Limit** – Select this option if you want the program to start when the air temperature is less than the temperature in the Temperature Limit field.
  - **Greater Than Limit** – Select this option if you want the program to start when the air temperature is greater than the temperature in the Temperature Limit field.
9. If you want to combine the temperature start condition with a day and time start, press the ↓ button to highlight **Only on Day & Time**, and then press the **OK** button to display a checkmark next to the option. Press the ⇒ button to configure the start days and start times. Refer to the procedure for Setting the Day and Time Start Condition on page 37.
  10. Press the **RUN** button to exit Program Setup.

### ***To Remove a Start Condition from a Program***

If you set up a start condition for a program that you no longer want it to be applied, you can remove it.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.



**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

3. Press the ↓ button to highlight the **Setup Prg. Start** option, and then press the **OK** button. The Setup Prg. Start screen displays the list of start conditions.
4. Press the ↓ button to highlight the start condition that you want to remove, and then press the **OK** button. The checkmark that displayed next to the option is removed, which indicates that the start condition is no longer applied to the program.
5. Press the **RUN** button to exit Program Setup.

## Setting a Seasonal Adjustment for a Program

If your area is experiencing unusually wet or dry weather and you want to adjust your entire system either up or down, you can adjust the watering by a percentage of normal.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

3. Press the ↑ or ↓ button to highlight the **Seasonal Adjust** option, and then press the **OK** button. The Seasonal Adjust screen displays.
4. Press the + or – button to change the percentage in the **Seasonal Adjust** field. Keep in mind that 100% causes the system to water as scheduled. If you enter 50%, the system decreases watering by half. If you enter 200%, the system doubles watering.



**Note:** When you set a Seasonal Adjust factor, it remains active until you change the number in this field to 100 to indicate that the system should water as scheduled. If you experience an unexpected watering schedule, check this field to determine whether you still have a seasonal adjustment factor set.

5. Press the **RUN** button to exit Program Setup.

## Setting Up Soak Cycles for a Program

Because each type of soil has a different rate at which it can absorb water, you should set up the runtime and soak time (“soak cycles”) for your zones to ensure that water soaks into the soil instead of being wasted. For example, if you are applying water at 0.4 inch per hour to an area of clay soil that can only absorb water at 0.2 inch per hour, the water that does not soak into the soil will either run off or evaporate. You can prevent water waste by breaking a program runtime into several soak cycles.

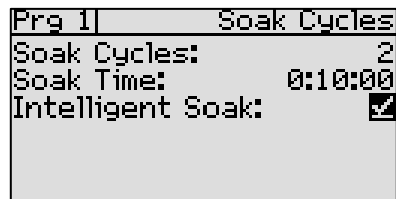
**Soak Cycle Example:** If your zone runtime is 60 minutes and you set up 3 soak cycles with a 40 minute soak time, the zone waters for 20 minutes, and then allows that water to soak in for 40 minutes. While this zone is soaking, other zones can run. After the 40 minute soak time, the zone will be allowed to run another 20 minutes after any zone that is currently running finishes.

With these settings, the zone completes its 60-minute runtime in three, 20-minute segments, with at least a 40 minute soak time between them.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

3. Press the **↑** or **↓** button to highlight the **Soak Cycles** option, and then press the **OK** button. The Soak Cycles screen displays.
4. Notice that the **Soak Cycles** field is highlighted. Press the + or – button to change the number to indicate how many soak cycles will occur.



5. Press the **↓** button to highlight the **Soak Time** field. Press the + or – button to change the time in this field to indicate how long you want the applied water to soak in.
6. Press the **↓** button to highlight the **Intelligent Soak** field. If you want to enable Intelligent Soak for this program, press the **OK** button to display a checkmark in the field.

When you enable the Intelligent Soak™ feature, the BaseStation 1000 uses intelligent watering algorithms that apply cycles in the optimal order to maximize water penetration and minimize evaporation loss. If there are many zones in a program, zones will be cycled and soaked until all have been completed. Zones that have completed their soak cycles are prioritized higher than zones that are still waiting to water so the first zones to start watering will be the first to complete.

**Note:** For more information about configuring soak cycles, refer to Using Soak Cycles with Soil Moisture Sensors on page 11.

7. Press the **RUN** button to exit Program Setup.

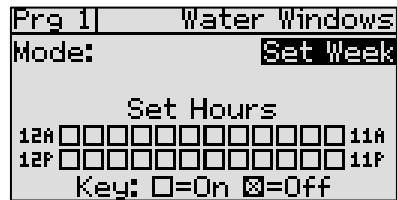
## Setting Up Water Windows for a Program

Water windows are used to indicate when watering will or will not be allowed. You can configure water windows on a weekly basis (having the same water window settings for each day of the week) or on a daily basis, where you can set each day of the week for a specific water window schedule.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

3. Press the **↓** button to highlight the **Water Windows** option, and then press the **OK** button. The Water Windows screen displays.



4. Press the + or – button to select one of the following settings in the **Mode** field:
  - **Set Week:** Establish the same water window settings for each day of the week on an hourly basis.
  - **Set Each Day:** Establish a specific water window schedule for each day of the week on an hourly basis.
5. Press the **↓** button to move to the water windows grid. By default, watering will be allowed during all hours as indicated by the unmarked boxes in the grid.
6. Perform one of the following tasks to make changes to the individual boxes in the grid. An outline displays around the box to indicate that you can change the setting in that box.
  - To move to another box in the grid, press the **←** or **→** button.
  - To turn on the water window for the time/day represented by that box, press the + button. The box displays as unmarked.
  - To turn off the water window for the time/day represented by that box, press the – button. An X displays in the box.
7. When you have finished setting up all the water windows for one program, do one of the following:
  - To set up water windows for another program, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.
 

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.
  - To continue setting up other components of the program, press the **BACK** button to return to the Program Setup screen, where you can select the next item that you want to set up.
  - To exit Program Setup, press the **RUN** button.

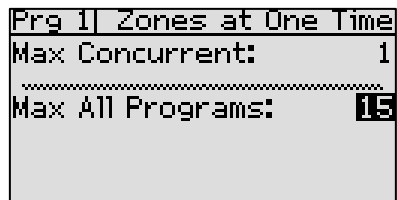
## Setting the Number of Zones that Can Run at One Time

Depending on the amount of water available from your water source and the electrical limits, your system might be able to operate more than one zone at a time. You can configure the BaseStation 1000 for a maximum number of zones that can run at one time for each program. You can also configure the maximum number of zones that can run at one time for all programs.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

3. Press the **↑** or **↓** button to highlight the **Zones at One Time** option, and then press the **OK** button. The Zones at One Time screen displays.



4. Press the **+** or **–** button to change the number in the **Max Concurrent** field to indicate the maximum number of zones that can run at the same time in this program.
5. Press the **↑** or **↓** button to move to the **Max All Programs** field.
6. Press the **+** or **–** button to change the number in the **Max All Programs** field to indicate the maximum number of zones that can run at the same time when more than one program is running at once.
7. Press the **RUN** button to exit Program Setup.

## Enabling or Disabling Programs

By default, all BaseStation 1000 programs are enabled, which means that those programs will run when devices are connected and configured (for example, zones have been given runtimes) for the programs. If you do not want certain programs to run, you can disable them. You can re-enable a disabled program as needed.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

3. Press the **↑** or **↓** button to highlight the **Enabled/Disable** option, and then press the **OK** button. The Enabled/Disable screen displays.

4. Press the **+** or **-** button to display or remove the checkmark in the **Enabled** field. When the checkmark is displayed, the program is active.
5. Press the **RUN** button to exit Program Setup.

## Setting a Pause Condition for a Program

In the BaseStation 1000, you can set up a condition that will cause a running program to pause when that condition occurs. The following pause conditions are available:

- **Moisture Pause** – If you have a soil moisture sensor installed, you can use this option to have a program pause when a specified soil moisture sensor limit is reached.
- **Event Switch Pause** – If you have an event switch device installed, you can use this option to have a program pause when a specified switch condition occurs.
- **Temperature Pause** – If you have an air temperature sensor installed, you can use this option to have a program pause when a specified temperature is reached.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the **PRG** button, and then press the **-** button repeatedly.

3. Press the **↓** button to highlight the **Setup Prg. Pause** option, and then press the **OK** button. The Setup Prg. Pause screen displays.

**Note:** If you want the controller to display a message whenever a program is paused, refer to Enabling Start, Pause, and Stop Messages on page 90.

4. Press the **↓** button to highlight the pause condition that you want to set up for the program, and then press the **OK** button. A checkmark displays next to the pause condition that you selected.
  - **Moisture Pause** – If you have a moisture sensor installed, you can use this pause condition to have a program pause when a specified moisture sensor limit is reached. When the sensor detects that the condition is no longer present, watering will begin again.
    - a. Notice that the serial number for one of your moisture sensors is highlighted in the **Moisture** field. If this is the serial number for the sensor installed in the area that this program will water, no change is required. If you need to assign a different moisture sensor to the program, press the **+** or **-** button to select a different serial number.
    - b. Press the **↓** button to highlight the **Moisture Limit** field, and then press the **+** or **-** button to change the number in the field. This number represents either the upper or lower limit.
    - c. Press the **↓** button to highlight one of the following pause options, and then press the **OK** button:

- **Less Than Limit** – Select this option if you want the program to pause when the moisture is less than the number in the Moisture Limit field. In this case, the number in the Moisture Limit field represents the lower limit.
- **Greater Than Limit** – Select this option if you want the program to pause when the moisture is greater than the number in the Moisture Limit field. In this case, the number in the Moisture Limit field represents the upper limit.
- **E. Switch Pause** – If you have an event switch installed, you can use this condition to have a program pause when a specified switch condition occurs.
  - a. Notice that the serial number for one of your event switches is highlighted in the **Event Switch** field. If this is the serial number for the event switch installed in the area that this program will water, no change is required. If you need to assign a different event switch to the program, press the + or – button to select a different serial number.
  - b. Press the ↓ button to highlight the **Trigger** field, and then press the + or – button to alternate between “When Open” and “When Closed” to indicate which switch condition will cause your program to pause.
  - c. Press the ↓ button to highlight the **Pause Hours** field, and then press the + or – button to indicate how many hours the program will pause when the switch condition occurs.
- **Temperature Pause** – If you have an air temperature sensor installed, you can use this pause condition to have a program pause when a specified temperature is reached.
  - a. Notice that the serial number for one of your air temperature sensors is highlighted in the **Temp. Sensor** field. If this is the serial number for the air temperature sensor installed in the area that this program will water, no change is required. If you need to assign a different air temperature sensor to the program, press the + or – button to select a different serial number.
  - b. Press the ↓ button to highlight value in the **Temperature Limit** field, and then press the + or – button to change the value in degrees Fahrenheit.
  - c. Press the ↓ button to highlight one of the following pause options, and then press the **OK** button:
    - **Less Than Limit** – Select this option if you want the program to pause when the air temperature is less than the Limit.
    - **Greater Than Limit** – Select this option if you want the program to pause when the air temperature is greater than the Limit.

## Setting a Stop Condition for a Program

In the BaseStation 1000, you can set up a condition that will cause a running program to stop when that condition occurs.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.  
**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.
3. Press the ↓ button to highlight the **Setup Prg. Stop** option, and then press the **OK** button. The Setup Prg. Stop screen displays.

**Note:** If you want the controller to display a message whenever a program stops, refer to Enabling Start, Pause, and Stop Messages on page 90.

4. Press the ↓ button to highlight the stop condition that you want to set up for the program, and then press the **OK** button. A checkmark displays next to the stop condition that you selected.
  - **Moisture Stop** – If you have a moisture sensor installed, you can use this stop condition to have a program stop running when a specified soil moisture sensor limit is reached or when the water level in a pond/cistern drops below a specified level.  
For suggestions on programming your controller for a moisture stop condition, refer to Tips for Setting Up Common Configurations on page 103.
    - a. Notice that the serial number for one of your moisture sensors is highlighted in the **Moisture** field. If this is the serial number for the sensor installed in the area that this program will water, no change is required. If you need to assign a different soil moisture sensor to the program, press the + or – button to select a different serial number.
    - b. Press the ↓ button to highlight the **Moisture Limit** field, and then press the + or – button to change the number in the field. Depending on how you are using the moisture sensor, this number represents either the upper or lower limit.

- c. Press the **↓** button to highlight one of the following stop settings, and then press the **OK** button:

Setting	Monitoring Soil Moisture Levels	Monitoring Pond/Cistern Levels
<b>Less Than Limit</b> (Lower Limit)	Use this option to <b>START</b> the program when the soil moisture is less than the number in the Moisture Limit field.  Refer to Setting a Moisture Start Condition on page 39.	Use this option to <b>STOP</b> the program when the water level in the pond/cistern is less than the number in the Moisture Limit field.
<b>Greater Than Limit</b> (Upper Limit)	Use this option to <b>STOP</b> the program when the soil moisture is greater than the number in the Moisture Limit field.  With this condition, you can set the limit with a calibration cycle.	Use this option to <b>START</b> the program when the water level in the pond/cistern is greater than the number in the Moisture Limit field.  Refer to Setting a Moisture Start Condition on page 39.

- d. Press the **↓** button to highlight the **Stop** field, and then press the **+** or **-** button to alternate between “At End of Cycle” and “Immediately.” Select one of the options to indicate when the moisture reading will cause your program to stop.

**Note:** To understand how these settings work with soak cycles and the various watering strategies, refer to Using Soak Cycles with Soil Moisture Sensors on page 11.

- e. Press the **↓** button to highlight the Calibration field. This field only displays when you select the Greater Than Limit.
- If the calibration has not been enabled, the Start? option displays on the right side of the screen. To start the calibration, highlight the **Start?** option, and then press the **OK** button.
  - If the calibration has been enabled, the Stop? option displays on the right side of the screen. To stop the calibration, highlight the **Stop?** option, and then press the **OK** button.

**Note:** When you enable calibration, the process either starts immediately or at the next day and time start. The program puts down 150% of the required water and then waits for 24 hours. The calibration reading is taken when the soil moisture is at field capacity. After the calibration cycle runs one time, it is disabled in the controller.



- **Event Switch Stop** – If you have an event switch installed, you can use this stop condition to have a program stop running when a specified switch condition occurs.
  - a. Notice that the serial number for one of your event switches is highlighted in the **Event Switch** field. If this is the serial number for the event switch installed in the area that this program will water, no change is required. If you need to assign a different event switch to the program, press the + or – button to select a different serial number.
  - b. Press the ↓ button to highlight the **Trigger** field, and then press the + or – button to alternate between “When Open” and “When Closed” to indicate which switch condition will cause your program to stop.

**Example:** You have a rain switch that uses hydroscopic discs to detect rain and halt watering. In this example, you would set the program stop condition for the switch to “When Open.”
  - c. Press the ↓ button to highlight the **Stop** field, and then press the + or – button to alternate between “At End of Cycle” and “Immediately.” Select one of the options to indicate when the switch condition will cause your program to stop.
- **Temperature Stop** – If you have an air temperature sensor installed, you can use this stop condition to have a program stop running when a specified temperature is reached.
  - a. Notice that the serial number for one of your air temperature sensors is highlighted in the **Temp. Sensor** field. If this is the serial number for the air temperature sensor installed in the area that this program will water, no change is required. If you need to assign a different air temperature sensor to the program, press the + or – button to select a different serial number.
  - b. Press the ↓ button to highlight value in the **Limit** field, and then press the + or – button to change the value in degrees Fahrenheit.
  - c. Press the ↓ button to highlight one of the following stop options, and then press the **OK** button:
    - **Less Than Limit** – Select this option if you want the program to stop when the air temperature is less than the Limit.
    - **Greater Than Limit** – Select this option if you want the program to stop when the air temperature is greater than the Limit.
  - d. Press the ↓ button to highlight the **Stop** field, and then press the + or – button to alternate between “At End of Cycle” and “Immediately.” Select one of the options to indicate when the temperature condition will cause your program to stop.

## Setting Up a Master Valve/Pump Start for a Program

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Use this option to associate a master valve or pump start biCoder with a program. Before you perform this procedure, you must assign a biCoder as a master valve or pump biCoder. Refer to Searching for and Assigning Master Valve and Pump Start biCoders on page 25.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.  
**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.
3. Press the ↓ button to highlight the **MV/Pump** option, and then press the **OK** button. The MV/Pump screen displays. The serial numbers of the biCoders that you assigned as master valve or pump start biCoders display on the left side of the screen.
4. Press the ↑ or ↓ button to move to the serial number of the master valve or pump start biCoder that you want to associate with this program, and then press the + or – button to select that serial number. A checkmark displays on the right side of the screen.

## Setting Up a Water Source for a Program

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The BaseStation 1000 can manage 1 complete water source (master valve, flow sensor, and pump start) and can be upgraded to support up to 3 water sources.

If your controller has been upgraded to support multiple water sources, you can associate a specific water source with a specific program or associate multiple water sources with one program.

1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to modify displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen.  
**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.
3. Press the ↓ button to highlight the **Water Source** option, and then press the **OK** button. The Water Source screen displays. The available water sources are listed. By default, water source 1 (WS-1) is enabled for all programs.
4. Perform one of the following:
  - If you want to disable WS-1 for a specific program, press the **PRG** button until the program that you want to modify displays in the upper-left corner of the screen, and then press the + or – button to remove the checkmark from the WS-1 field.

- If multiple water sources are available on the Water Source screen, you can perform the previous procedure to disable WS-1 for a specific program and then associate a different water source with that program. Make sure that the correct program displays in the upper-left corner of the screen. Press the ↓ button to highlight an unassigned water source, and then press the + or – button to add a checkmark in the WS field.
- If multiple water sources are available on the Water Source screen, you can associate more than one water source with a program. Make sure that the correct program displays in the upper-left corner of the screen. Press the ↓ button to highlight an unassigned water source, and then press the + or – button to add a checkmark in the WS field.

## Setting Up a Rain Delay

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When rain is expected, you can set up a rain delay that will prevent the controller from watering while the delay is active. The rain delay stops all programs and sets the status of all watering events to “Done.”

1. Press the **RUN** button.
2. Press the **BACK** button. The Status Report menu displays.
3. Press the ↑ or ↓ button to highlight **Rain Delay**, and then press the **OK** button. The Rain Delay screen displays. When no rain delay is set, the Days to Delay field displays Off.
4. Press the + or – button to set the number in the **Days to Delay** field for the number of days that you want the system to stop watering.



**Note:** In the controller, 1 day is from the time you set up the rain delay until midnight on that same day. The next day begins at 12:01am and ends at midnight.

5. When you have finished setting up the rain delay, press the **RUN** button. The Rain Delay status displays in the upper-left corner of the screen.

## Setting Up Event Days

In the BaseStation 1000, you can set up as many as 8 events that will pause watering. An event day blocks any watering from starting and pauses any watering that was in progress when the event day started. When the event day is over, the controller automatically clears the event day settings and resumes watering.

1. Press the **RUN** button.
2. Press the **BACK** button. The Status Report menu displays.
3. Press the **↑** or **↓** button to highlight **Event Days**, and then press the **OK** button. The Event Days screen displays. When events are not set, the available event days are listed without times next to them.
4. Press the **↓** button to move to the event day that you want to set up, and then press the **OK** button.
5. Press the **↓** button to move to the **Start** field. Default event date and time information displays in the Start and End fields.
6. Press the **⇒** button to move to the start date or time that you want to change, and then press the **+** or **-** button to change the numbers.
7. Press the **↓** button to move to the **End** field.
8. Press the **⇒** button to move to the end date or time that you want to change, and then press the **+** or **-** button to change the numbers.
9. If you want to set up another event day, press the **BACK** button to return to the list. Repeat steps 4 – 8.
10. If you set up an event day that you no longer need, find that event day in the list, and then press the **OK** button to display the Start and End fields. When the **Clear Event** option is highlighted, press the **OK** button. The information is removed from the Start and End fields.
 

**Note:** The controller automatically clears event days when they are past.
11. When you have finished setting up the event days, press the **RUN** button. When an event day is active, the Event Day status displays in the upper-left corner of the screen.

## 6 – Flow Management & Monitoring

---

When properly configured with a flow device, the BaseStation 1000 can provide an extensive set of flow monitoring and management capabilities to help understand how water is being used and to reduce the effects of pipeline breaks and sprinkler malfunctions. It can monitor actual water flow rates and then compare them against the expected or design flow rates and provide alerts and perform actions when limits or boundaries are exceeded. The system may be able to reduce the overall completion time of a watering cycle by running the number of zones to make best use of the available water during the watering cycle.

Using a flow device to monitor water flow rates and water used is the best way to manage this precious resource, but even without a flow device, the BaseStation 1000 has many capabilities that can improve the efficiency of your system.

### Assigning a Flow Sensor to a Water Source

---

If you have a flow biCoder connected to your system, you can assign it to a water source.

1. Perform the steps in Searching For and Assigning Flow biCoders on page 28.
2. Press the **Flow Setup** button. The Flow Setup menu displays.
3. The **Water Source Setup** option should be highlighted. If it is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Water Source Setup screen displays.
4. Press the **↓** button to highlight the water source that you want to assign the flow sensor to, and then press the **OK** button. The Flow Setup menu for that water source displays.
5. The **Flow Sensors** option should be highlighted. If it is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Flow Sensors screen displays and shows the flow devices that are connected to the system.
6. Press the **↓** button to highlight the flow device that you want to assign to the water source, and then press the **OK** button.

## Assigning a Master Valve/Pump Start biCoder to a Water Source

---

If you have a master valve/pump start biCoder connected to your system, you can assign it to a water source.

1. Perform the steps in Searching for and Assigning Master Valve/Pump Start biCoders on page 25.
2. Press the **Flow Setup** button. The Flow Setup menu displays.
3. The **Water Source Setup** option should be highlighted. If it is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Water Source Setup screen displays.
4. Press the **↓** button to highlight the water source that you want to assign the master valve/pump start biCoder to, and then press the **OK** button. The Flow Setup menu for that water source displays.
5. Press the **↑** or **↓** button to highlight the **MVs/Pumps** option, and then press the **OK** button. The MVs/Pumps screen displays and shows the MV/pump biCoders that are connected to the system.
6. Press the **↓** button to highlight the MV/pump biCoder that you want to assign to the water source, and then press the **OK** button.

## Limiting Zones by Flow for a Water Source

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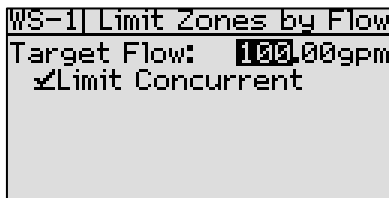
You can enter a target flow in gallons per minute (GPM) for the water source that supplies water through the flow device to the rest of the irrigation system. The BaseStation 1000 uses this value to manage the number of zones that can run at one time so that the water source is used as efficiently as possible. If you set this value to zero, you cannot use this GPM amount to control concurrent zones.

1. Press the **Flow Setup** button. The Flow Setup menu displays.
2. The **Water Source Setup** option should be highlighted. If it is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Water Source Setup screen displays.
3. Press the **↓** button to highlight the water source that you want to limit zones by flow for, and then press the **OK** button. The Flow Setup menu for that water source displays.
4. Press the **↑** or **↓** button to highlight the **Flow Management** option, and then press the **OK** button. The Flow Management menu displays.

- The **Limit Zones by Flow** option should be highlighted. If it is not highlighted, press the  $\uparrow$  or  $\downarrow$  button to highlight it, and then press the **OK** button. The Limit Zones by Flow screen displays.

- In the **Target Flow** field, the gallons per minute (gpm) value is highlighted. Press the + or – button to change the number in the field.

- To change the value of the digits to the right of the decimal, press the  $\Rightarrow$  button to highlight those digits, and then press the + or – button to change the number.



**Note:** Press and hold the + button or the – button to rapidly increase or decrease the number in the field.

- Press the  $\downarrow$  button to highlight the **Limit Concurrent** field, and then press the + or – button to display a checkmark in the field. The checkmark indicates that the system will limit the number of zones that can run at the same time by the gallons per minute in the Target Flow field.

## Setting a High Flow Limit for a Water Source

You can enter a high flow limit for a running water source and then set up the system to shut down the water source if that limit is exceeded. The system uses this gallons per minute (gpm) value as a critical limit. When this value is greater than zero, the system compares the limit against the measured reading from the flow device every minute. If the flow rate reading exceeds the limit for three or four minutes in a row, the system generates an alert. If you enable the Shut Down field, then programs using this water source will be stopped and corresponding master valves (MVs) will be shut off when the flow rate exceeds the limit.

- Press the **Flow Setup** button. The Flow Setup menu displays.
- The **Water Source Setup** option should be highlighted. If it is not highlighted, press the  $\uparrow$  or  $\downarrow$  button to highlight it, and then press the **OK** button. The Water Source Setup screen displays.
- Press the  $\downarrow$  button to highlight the water source that you want to set the flow limit for, and then press the **OK** button. The Flow Setup menu for that water source displays.
- Press the  $\uparrow$  or  $\downarrow$  button to highlight the **Flow Management** option, and then press the **OK** button. The Flow Management menu displays.
- Press the  $\downarrow$  button to highlight the **High Flow Limit** option, and then press the **OK** button. The High Flow Limit screen displays.

6. In the **Flow Limit** field, the gallons per minute (gpm) value is highlighted. Press the + or – button to change the number in the field.
  - To change the value of the digits to the right of the decimal, press the ⇨ button to highlight those digits, and then press the + or – button to change the number.

**Note:** Press and hold the + button or the – button to rapidly increase or decrease the number in the field.
7. Press the ↓ button to highlight the **Shut Down** field, and then press the + or – button to display a checkmark in the field. The checkmark indicates that the system will shut down the water source if the gallons per minute in the Flow Limit field is exceeded.

## Setting an Unexpected Flow Limit

---

You can enter a flow limit for a water source that is turned off and then set up the system to shut down the water source if that limit is exceeded. When you enable this feature, the system will monitor the flow even when the water source is off in order to prevent water loss due to a broken pipe.

When you have a NOMV, you can set this limit to allow some flow that is off schedule, such as from manual taps or hose bibs.

1. Press the **Flow Setup** button. The Flow Setup menu displays.
2. The **Water Source Setup** option should be highlighted. If it is not highlighted, press the ↑ or ↓ button to highlight it, and then press the **OK** button. The Water Source Setup screen displays.
3. Press the ↓ button to highlight the water source that you want to set the flow limit for, and then press the **OK** button. The Flow Setup menu for that water source displays.
4. Press the ↑ or ↓ button to highlight the **Flow Management** option, and then press the **OK** button. The Flow Management menu displays.
5. Press the ↓ button to highlight the **Unexpected Flow Limit** option, and then press the **OK** button. The Unexpected Flow Limit screen displays.
6. In the **Flow Limit** field, the gallons per minute (gpm) value is highlighted. Press the + or – button to change the number in the field.
  - To change the value of the digits to the right of the decimal, press the ⇨ button to highlight those digits, and then press the + or – button to change the number.

**Note:** Press and hold the + button or the – button to rapidly increase or decrease the number in the field.
7. Press the ↓ button to highlight the **Shut Down** field, and then press the + or – button to display a checkmark in the field. The checkmark indicates that the system will shut down the water source if the gallons per minute in the Flow Limit field is exceeded.



## Enabling Flow Variance

---

On the BaseStation 1000, flow variance monitors a water source for flow that exceeds the variance limit. During normal program watering, the controller compares the sum of the design flow (or learned flow) from all running zones against the measured flow of the flow device (or the sum of all flow devices supplying water to the mainline). The measured flow may be higher than the expected flow. When the ratio becomes greater than the variance limit, the controller identifies the faulty zone and stops it. A message displays on the controller and in BaseManager. The zone will not run again until the message and the fault are cleared.

You can set the flow variance limit to any value between 10% and 200%.

1. Press the **Flow Setup** button. The Flow Setup menu displays.
2. The **Water Source Setup** option should be highlighted. If it is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Water Source Setup screen displays.
3. Press the **↓** button to highlight the water source that you want to enable a flow variance limit for, and then press the **OK** button. The Flow Setup menu for that water source displays.
4. Press the **↑** or **↓** button to highlight the **Flow Management** option, and then press the **OK** button. The Flow Management menu displays.
5. Press the **↓** button to highlight the **Flow Variance Limit** option, and then press the **OK** button. The Flow Variance Limit screen displays.
6. In the **Variance Limit** field, press the **+** or **-** button to change the number for the variance limit.
7. Press the **↓** button to highlight the **Flow Variance Enable** field. Perform one of the following actions:
  - If flow variance is currently enabled, **a checkmark displays** in the Flow Variance Enable field. Press the **+** or **-** button to remove the checkmark.
  - If flow variance is currently disabled, **there is no checkmark** in the Flow Variance Enable field. Press the **+** or **-** button to replace the checkmark.

## Setting the Pipe Fill Time for a Water Source

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To calibrate the Learn Flow process on the BaseStation 1000, you should enter the pipe fill time before you initiate the Learn Flow. The pipe fill time is the number of minutes that it takes to fill the empty line, activate the valve, and reach a steady state operating pressure.

**Note:** The easiest way to determine the pipe fill time is to turn on the zone and then time how long it takes until you see water flowing at a steady pressure.

1. Press the **Flow Setup** button. The Flow Setup menu displays.

2. The **Water Source Setup** option should be highlighted. If it is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Water Source Setup screen displays.
3. Press the **↓** button to highlight the water source that you want to set the pipe fill time for, and then press the **OK** button. The Flow Setup menu for that water source displays.
4. Press the **↑** or **↓** button to highlight the **Flow Management** option, and then press the **OK** button. The Flow Management menu displays.
5. Press the **↓** button to highlight the **Pipe Fill Time** option, and then press the **OK** button. The Pipe Fill Time screen displays.
6. In the **Fill Time** field, press the **+** or **-** button to change the number. The Fill Time value is the number of minutes that it takes to fill the empty line, activate the valve, and reach a steady state operating pressure. The fill time is used for each zone during the learn flow cycle.

**Note:** Press and hold the **+** button or the **-** button to rapidly increase or decrease the number in the field.

## Enabling or Disabling a Water Source

---

By default, the BaseStation 1000 enables all connected water sources. You can disable a water source as needed and then re-enable it at another time. If you disable a water source, programs associated with that water source will still try to run, but no water will be available.

1. Press the **Flow Setup** button. The Flow Setup menu displays.
2. The **Water Source Setup** option should be highlighted. If it is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Water Source Setup screen displays.
3. Press the **↓** button to highlight the water source that you want to enable or disable, and then press the **OK** button. The Flow Setup menu for that water source displays.
4. Press the **↑** or **↓** button to highlight the **Enable/Disable** option, and then press the **OK** button. The Enable/Disable screen displays.
5. Perform one of the following actions in the **Enabled** field:
  - If the water source is currently enabled, a **checkmark displays** in the Enabled field. Press the **+** or **-** button to remove the checkmark.
  - If the water source is currently disabled, **there is no checkmark** in the Enabled field. Press the **+** or **-** button to replace the checkmark.

## Learning Flow

With one or more flow devices, the BaseStation 1000 has the ability to do a learn flow cycle to determine the flow for zones. You can run the learn flow cycle either by all zones or for individual zones. When you schedule a learn flow cycle, it only runs one time.

When the learn flow cycle begins, it will pause any running programs, and it will run one zone at a time to learn its flow. It will take several minutes to learn the flow for each zone. For example, if the pipe fill time is two minutes, here are the learn flow steps for each zone.

1. Turn on the zone and MVs and pumps.
2. After two minutes, the pipe has filled and the flow has stabilized.
3. The next good flow reading is recorded.

### Learning the Flow for All Zones

**IMPORTANT NOTE!** The learn flow cycle starts as soon as you select the Learn All Zones option. Depending on how many zones are enabled on your system, the learn flow cycle could take more than an hour to complete. If you need to cancel the learn flow cycle while it is in progress, press the BACK button.

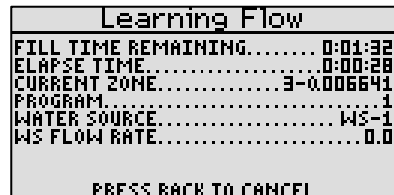
**Note:** The learn flow cycle uses the fill time setting that you configured in the Pipe Fill Time screen. If you want to change the number of minutes required to fill the pipe and stabilize the flow, refer to Setting the Pipe Fill Time for a Water Source on page 59.

1. Press the **Flow Setup** button. The Flow Setup screen displays.
2. Press the **↓** button to highlight **Learn Flow**, and then press the **OK** button to select it. The Learn Flow screen displays.
3. If the program that turns on the MV/pump for the zones displays in the upper-left corner of the screen, continue to step 4. Otherwise, press the **PRG** button until the correct program displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the **-** button repeatedly.

4. If the **Learn All Zones** option is highlighted, press the **OK** button to select it. Otherwise, press the **↑** or **↓** button to highlight **Learn All Zones**, and then press the **OK** button. The Learning Flow screen displays and indicates that the Learn Flow process has started.

**Note:** If you need to cancel the learn flow cycle while it is in progress, press the BACK button.



When the learn flow cycle is finished, the results display on the Learn Flow Done screen.

## Learning the Flow by Zone

For each zone, you can either set the design flow manually (refer to Setting Up Zones on page 24), or you can run a learn flow cycle and have its design flow set automatically. You should reconfigure the design flow for a zone whenever you change out a sprinkler or emitter on a zone or whenever the learn flow cycle fails for a zone.

**Note:** The learn flow cycle uses the fill time setting that is configured in the Pipe Fill Time screen. If you want to change the number of minutes required to fill the pipe and stabilize the flow, refer to Setting the Pipe Fill Time for a Water Source on page 59.

1. Press the **Flow Setup** button. The Flow Setup screen displays.
2. Press the  $\downarrow$  button to highlight **Learn Flow**, and then press the **OK** button to select it. The Learn Flow screen displays.
3. If the program that turns on the MV/pump for the zone displays in the upper-left corner of the screen, continue to step 4. Otherwise, press the **PRG** button until the correct program displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

4. Press the  $\uparrow$  or  $\downarrow$  button to highlight **Learn One Zone**, and then press the **OK** button to select it. The Learn One Zone screen displays the list of zones.
5. Press the  $\uparrow$  or  $\downarrow$  button to highlight the zone that you want to learn flow for, and then press the **OK** button to start the learn flow cycle. The Learning Flow screen displays.

**Note:** If you need to cancel the learn flow cycle while it is in progress, press the BACK button.

When the learn flow cycle is finished, the results display on the Learn Flow Done screen.

## 7 – Manual Operations

The BaseStation 1000 has several options that enable you to manually control your irrigation system. You can start a program, stop a program that is actively watering, or run a master valve.

You can also manually water a single zone, all zones, or the zones of a program. The Manual Run options are useful for doing a walk-around test of multiple valves, or for applying additional water for a short period of time to a specific zone.

### Manually Starting or Stopping a Zone

Use the Manual Start/Stop Zone option when you want to quickly start an individual zone or stop a zone that you started with this option. You can set the manual runtime between 1 second and 18 hours.

**Note:** You cannot use this option to stop a zone that is running in a program. Use the Start/Stop Program option to stop a currently running program.

1. Press the **Manual Run** button. The Manual Run menu displays.
2. The **Manual Start/Stop Zone** option should be highlighted. If it is not highlighted, press the  $\uparrow$  or  $\downarrow$  button to highlight it, and then press the **OK** button. The Manual Start/Stop Zone screen displays.
3. Press the  $\downarrow$  button to move to the **Runtime** field. Notice that the field shows the default runtime of 10 minutes. The hour placeholder is highlighted.
  - To move to the minutes placeholder, press the  $\Rightarrow$  button.
  - To move to the seconds placeholder, press the  $\Rightarrow$  button again.
  - To change the time, press the  $+$  or  $-$  button.

**Note:** To rapidly increase or decrease the value, press and hold the  $+$  button or the  $-$  button.
4. If you want to allow more than one zone to run at one time during the manual run, press the  $\downarrow$  button to highlight **Max Concurrent**, and then press the  $+$  or  $-$  button to change the number.
5. Press the  $\uparrow$  button to highlight the **Select Zone(s)** field, and then press the **OK** button. The list of zones displays.



6. Press the **↓** button to highlight the zone that you want to start or stop, and then press the **OK** button.

Any zone that is started with this option shows the runtime countdown to the right of the zone number. The zones that are not running show Done as their status. If the Max Concurrent field was set to 1 on the previous screen and you start more than one zone on this screen, the status of the additional zones is set to Waiting.

**IMPORTANT NOTE!** If you press a button on the controller to leave this screen while a manual run is in progress, the manual run will stop.

## Manually Running Individual Zones by Program

---

You can set the manual runtime between 1 second and 18 hours.

1. Press the **Manual Run** button. The Manual Run menu displays.
2. Press the **↑** or **↓** button to highlight **Run Prg Zone(s)**, and then press the **OK** button. The Run Prg Zone(s) screen displays.
3. If the program that you want to run zones for displays in the upper-left corner of the screen, continue to step 4. Otherwise, press the **PRG** button until the program that you want displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the **-** button repeatedly.

4. If you want to allow more than one zone to run at one time during the manual run, press the **↓** button to highlight **Max Concurrent**, and then press the **+** or **-** button to change the number.
5. If you want to delay the start of the manual run, press the **↓** button to highlight **Start Delay**. Notice that the minutes placeholder is highlighted.
  - To move to the hour placeholder, press the **←** button.
  - To move to the seconds placeholder, press the **⇒** button.
  - To change the time, press the **+** or **-** button.

**Note:** To rapidly increase or decrease the value, press and hold the **+** button or the **-** button.

6. If you want a delay between the zones of the manual run, press the **↓** button to highlight **Zone Delay**. Notice that the minutes placeholder is highlighted.

**Note:** If the Max Concurrent field is set to more than 1, the Zone Delay field does not display.

- To move to the hour placeholder, press the **←** button.
- To move to the seconds placeholder, press the **⇒** button.
- To change the time, press the **+** or **-** button.

**Note:** To rapidly increase or decrease the value, press and hold the **+** button or the **-** button.

- Press the **↑** button to highlight the **Set Manual Runtimes** option, and then press the **OK** button. The Run Prg Zone(s) screen displays.

- Notice that the minutes placeholder in the **Zone 1** field is highlighted.

Prg 1	Run Prg Zone(s)
1-E012471:	0:00:00
3-0006641:	0:00:00
4-0006642:	0:00:00
5-0006643:	0:00:00
6-0006644:	0:00:00
<b>ZONE 1</b>	

- To move to the hour placeholder, press the **←** button.
- To move to the seconds placeholder, press the **⇒** button.
- To change the time, press the **+** or **-** button.

**Note:** To rapidly increase or decrease the value, press and hold the **+** button or the **-** button.

- To move to a different zone, press the **↑** or **↓** button.

- After you have set the amount of time for each zone that you want to run manually, press the **OK** button. The Manual Run screen displays the elapsed time.

- When the manual run is complete, the message screen displays “No Running Zones.” Choose one of the following options:

- If you want to start another manual run with the same runtimes, press the **Manual Run** button. Select the **Run Prg Zone(s)** option and then the **Set Manual Runtimes** option. The runtimes that you entered in the fields on the Run Prg Zone(s) screen are saved. Press the **OK** button to start the manual run.
- If you want to start another manual run with different runtimes, press the **Manual Run** button. Select the **Run Prg Zone(s)** option, and then select the **Clear Manual Runtimes** option. The system automatically clears all the runtimes that you entered in the fields on the Run Zone(s) screen. Select the **Set Manual Runtimes** option, enter the new runtimes, and then press the **OK** button to start the manual run.
- If you want to display the Zone Status, press the **BACK** button. Press the **↑** or **↓** button to highlight **Zone Status**, and then press the **OK** button.

## Manually Running All Zones in a Program

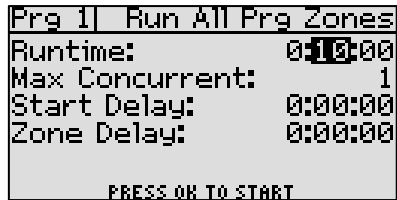
In the BaseStation 1000, you can manually run all zones by program. You can set the manual runtime between 1 second and 18 hours.

- Press the **Manual Run** button. The Manual Run menu displays.
- Press the **↑** or **↓** button to highlight **Run All Prg Zones**, and then press the **OK** button. The Run All Prg Zones screen displays.
- If the program that you want to run zones for displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the **PRG** button, and then press the **-** button repeatedly.

- Notice that the minutes placeholder in the **Runtime** field is highlighted.

- To move to the seconds placeholder, press the  $\Rightarrow$  button.
- To move to the hour placeholder, press the  $\Leftarrow$  button.
- To change the time, press the + or – button.



**Note:** To rapidly increase or decrease the value, press and hold the + button or the – button.

- Press the  $\Downarrow$  button to highlight the number in the **Max Concurrent** field, and then press the + or – button to change the number to indicate the maximum number of zones that can run at the same time during this manual run.

- If you want to delay the start of the manual run, press the  $\Downarrow$  button to highlight **Start Delay**. Notice that the minutes placeholder is highlighted.

- To move to the hour placeholder, press the  $\Leftarrow$  button.
- To move to the seconds placeholder, press the  $\Rightarrow$  button.
- To change the time, press the + or – button.

**Note:** To rapidly increase or decrease the value, press and hold the + button or the – button.

- If you want a delay between the zones of the manual run, press the  $\Downarrow$  button to highlight **Zone Delay**. Notice that the minutes placeholder is highlighted.

**Note:** If the Max Concurrent field is set to more than 1, the Zone Delay field does not display.

- To move to the hour placeholder, press the  $\Leftarrow$  button.
- To move to the seconds placeholder, press the  $\Rightarrow$  button.
- To change the time, press the + or – button.

**Note:** To rapidly increase or decrease the value, press and hold the + button or the – button.

- Press the **OK** button. The Manual Run screen displays the elapsed time for the currently running zone.

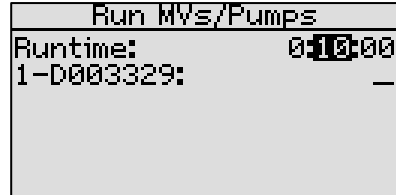
- When the manual run is complete, the Run screen displays “No Running Zones.” Choose one of the following options:

- If you want to return to the Manual Run menu, press the **Manual Run** button.
- If you want to display the Zone Status, press the **BACK** button. Press the  $\Uparrow$  or  $\Downarrow$  button to highlight **Zone Status**, and then press the **OK** button.



## Manually Running Master Valves/Pumps

1. Press the **Manual Run** button. The Manual Run menu displays.
2. Press the **↑** or **↓** button to highlight **Run MVs/Pumps**, and then press the **OK** button. The Run MVs/Pumps screen displays.
3. Notice that the minutes placeholder in the **Runtime** field is highlighted.



- To move to the seconds placeholder, press the **⇒** button.
- To move to the hour placeholder, press the **⇐** button.
- To change the time, press the **+** or **-** button.

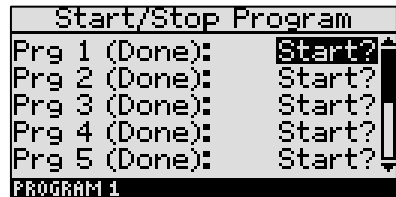
**Note:** To rapidly increase or decrease the value, press and hold the **+** button or the **-** button.

4. Press the **↓** button to highlight the fields for the MV/Pumps that you want to run, and then press the **+** button to select the devices.
5. To start the manual run, press the **RUN** button.

## Manually Starting or Stopping a Program

1. Press the **Manual Run** button. The Manual Run menu displays.
2. Press the **↑** or **↓** button to highlight **Start/Stop Program**, and then press the **OK** button. The Start/Stop Program screen displays.
3. In the list of programs, press the **↑** or **↓** button to move to the program that you want to start or stop.

- If the program is idle, the **Start?** option displays on the right side of the screen. To start the program, highlight the **Start?** option, and then press the **OK** button. The label to the right of the program number changes to "Running."
- If the program is running, the **Stop?** option displays on the right side of the screen. To stop the program, highlight the **Stop?** option, and then press the **OK** button. The label to the right of the program number changes to "Done."



**Note:** To check the status of the program, press the **RUN** button, and then press the **BACK** button. On the Status menu, press the **↓** button to move to the Program Status option, and then press the **OK** button. The Program Status screen display. Refer to Viewing the Program Status Report on page 87.

## Setting the Controller to OFF

---

Press the **OFF** button when you want to halt all watering for an indefinite period of time. All current watering cycles will be stopped. No watering cycles will be started. Use this button for seasonal shutdown. **DO NOT** power down the BaseStation.

When set to OFF, the controller enforces the following conditions:

- The status “SYSTEM OFF” displays in the upper-left corner of the screen.
- The screen displays the Zone Status report.
- It will continue to take biSensor moisture readings every ten minutes and log them into memory.
- It will monitor and record flow rate and water usage and will shut down master valves on high flow, or unscheduled flow if these settings are enabled. Flow readings will be taken at the same time as moisture readings unless the two-wire is powered down between readings.

## 8 – System Setup

The BaseStation 1000 has a number of features that enable you to set up and maintain the controller. You can back up your system with a USB drive, and then you can use those backup files to restore your system if it ever goes down. You can also ensure that your controller has the most current firmware code with a download from the Baseline web site or from BaseManager.

### Setting the Controller Date and Time

Set or change the controller date and time to match the current date and time. If the controller is connected to BaseManager, the time will be automatically set by the server.

**WARNING!** Changing the date and time can cause watering events to be missed.

1. Press the **System Setup** button. The System Maintenance menu displays.
2. The **Time & Date Setup** option should be highlighted. If it is not highlighted, press the  $\uparrow$  or  $\downarrow$  button to highlight it, and then press the **OK** button. The Time & Date Setup screen displays.
3. In the **Time** field, notice that the hours placeholder is highlighted.
  - To change the time, press the **+** or **-** button.
  - To move to the minutes placeholder, press the  $\Rightarrow$  button.
4. Press the  $\downarrow$  button to move to the **Date** field.
  - Press the  $\Leftarrow$  or  $\Rightarrow$  button to move to the date field that you want to change.
  - Press the **+** or **-** button to change the value in the field.
5. Press the  $\downarrow$  button to move to the **Weekday** field, and then press the **+** or **-** button to change the value in the field.
6. Press the  $\downarrow$  button to move to the **Time Format** field, and then press the **+** or **-** button to change the value in the field. This field enables you to switch the time format between AM/PM and 24 hour settings.
 

**Example:**      In AM/PM format      10:00A and 10:00P  
                      In 24 hour format      10:00 and 22:00
7. When you have finished making changes, press the **RUN** button.

## Setting Up the Default Network Connection

---

The BaseStation 1000 is equipped for Internet-based LiveView™ which makes your controller accessible anytime from anywhere, with any Internet-accessible device. The first step for enabling Internet-based LiveView is to connect your controller to the Internet through your network. The controller uses the Dynamic Host Configuration Protocol (DHCP) to have the IP address automatically set by the network.

**Note:** The next step for enabling Internet-based LiveView is connecting to a BaseManager server. Refer to Connecting to BaseManager on page 75 and Viewing BaseManager Info on page 76.

1. Plug an Ethernet cable into the Ethernet port on the back of the controller board and plug the other end of the cable into a live Ethernet jack.
  2. On the controller, press the **System Setup** button. The System Setup menu displays.
  3. Press the **↓** button to highlight the **Network Setup** option, and then press the **OK** button to select it. The Network Setup menu displays.
  4. The **Ethernet Setup** option should be highlighted. If it is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Ethernet Setup screen displays.
  5. Press the **+** or **-** button to change the value in the **DHCP Enabled** field. The controller uses the Dynamic Host Configuration Protocol (DHCP) to establish the network connection.
    - If DHCP is currently enabled, **a checkmark displays** in the Enabled field. Press the **+** or **-** button to remove the checkmark.
    - If DHCP is currently disabled, **there is no checkmark** in the Enabled field. Press the **+** or **-** button to replace the checkmark. Refer to Setting Up a Static IP Address on page 70.
- Note:** To see the how the DHCP protocol automatically configured the network settings, review the Network Info screen.
6. Continue to the Enabling the BaseManager Connection procedure on page 72.

## Setting Up a Static IP Address

---

DHCP (Dynamic Host Configuration Protocol) allows your controller to automatically obtain an IP address, which enables the connection to the Internet. Every time you restart your controller, it retrieves a new IP address. DHCP is the default network configuration for the BaseStation 1000.

In some cases, private network configurations or network security issues might require that you configure a static IP address for your controller.

1. Plug an Ethernet cable into the Ethernet port on the back of the controller board and plug the other end of the cable into a live Ethernet jack.
2. On the controller, press the **System Setup** button. The System Setup menu displays.
3. Press the **↓** button to highlight the **Network Setup** option, and then press the **OK** button to select it. The Network Setup menu displays.
4. The **IP Setup** option should be highlighted. If it is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Ethernet Setup screen displays.

- Press the + or – button to remove the checkmark in the **DHCP Enabled** field. The fields for the network settings display.

**Note:** Ask your network administrator for the settings. For an explanation of the settings, refer to Viewing the IP Information Screen on page 71.

IP Setup	
DHCP Enabled:	<input type="checkbox"/>
IP Addr:	10.11.12.81
Mask:	255.255.255.0
Gateway:	10.11.12.3
DNS 1:	10.11.12.3
DNS 2:	0.0.0.0

- Press the ↓ button to highlight the first digits in the **IP Addr** field.
  - Press the ← or → button to move to the digits that you want to change.
  - Press the + or – button to change the value in the field.

**Note:** To rapidly increase or decrease the value, press and hold the + button or the – button.
- Press the ↓ button to move to the other fields that you need to change. Use the procedure described in step 6 to move within the digits and change the values.
- To view the status of your network connection, go to the IP Info option. Refer to Viewing the IP Information Screen on page 71.

## Viewing the IP Information Screen

When your controller is connected to the Internet with a communication method such as an Ethernet cable, a cell modem, an Ethernet radio, or a Wi-Fi module, the system automatically assigns the networking addresses that enable the connection. You do not need to change any of this IP (Internet protocol) information, but you might need to refer to it in order to complete your connection or to troubleshoot it.

- Press the **System Setup** button. The System Setup menu displays.
- Press the ↓ button to highlight the **Network Setup** option, and then press the **OK** button to select it. The Network Setup menu displays.

- Press the ↓ button to highlight the **IP Info** option, and then press the **OK** button to select it. The IP Info screen displays the following information:

IP Info	
STATUS.....	CONNECTED
INTERFACE.....	ETHERNET
IP ADDR.....	10.11.12.81
MASK.....	255.255.255.0
GATEWAY.....	10.11.12.3
DNS 1.....	10.11.12.3
DNS 2.....	0.0.0.0
MAC.....	0004A354A846

- Status** – Indicates whether the controller is connected to the Internet
- Interface** – If the controller is connected, this field indicates what communication interface is in use.
- IP Addr** – An Internet Protocol address (IP address) is a number assigned to a device (such as the controller) that is connected to a computer network and uses the Internet Protocol to communicate on the network.
- Mask** – The subnet mask is used with an IP address to indicate what network traffic should be permitted or denied.
- Gateway** – An IP address that enables the network traffic from your controller to pass through to a larger network

- **DNS 1** – A naming system (Domain Name System) for devices, such as your controller, that are connected to the Internet
- **DNS 2** – An additional domain name that is assigned to your controller
- **MAC** – The Media Access Control address (MAC address) is a unique identifier for your controller’s network connection

## Setting Up the Web Server for Local LiveView

---

If you can connect an Ethernet cable between your controller and a live Ethernet port on your local area network, you can enable the controller’s web server and then use Local LiveView™ on a computer or other web-enabled device that is connected to the same network.

**IMPORTANT NOTE!** You cannot use Local LiveView to remotely operate the controller from outside the local network. If you want to operate the controller from an external network, you need to use Internet-based LiveView or BaseManager.

1. Press the **System Setup** button. The System Setup menu displays.
2. Press the **↓** button to highlight the **Network Setup** option, and then press the **OK** button to select it. The Network Setup menu displays.
3. Press the **↓** button to highlight the **Web Server Setup** option, and then press the **OK** button to select it. The Web Server Setup screen displays.
4. In the **Enabled** field, press the **+** button to display a checkmark. Additional fields display on the screen.
5. Press the **↓** button to move to the **Force SSL** field. Secure Sockets Layer (SSL) allows the controller to communicate across a network in a secure manner. If you want to force SSL, press the **+** button to display a checkmark in the field.  
**Note:** When Force SSL is selected, the user needs to type **HTTPS://** before the IP Address. Refer to the steps in Using Local LiveView to Remotely Operate the Controller on page 73.
6. Press the **↓** button to move to the **Require PIN** field. If you want to require users to enter a personal identification number (PIN) to access the web server, press the **+** button to display a checkmark in the field.
7. Perform one of the following procedures:
  - If you did not select the Require PIN field, skip to step 8.
  - If you selected the Require PIN field, press the **↓** button to move to the **PIN** field. Press the **←** or **⇒** button to move to the digit that you want to change, and then press **+** or **–** button to change the number.
8. Continue to the procedure for using Local LiveView to remotely operate the controller on page 73.

## Using Local LiveView to Remotely Operate the Controller

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If you can connect an Ethernet cable between your controller and a live Ethernet port on your local area network, you can enable the controller's web server and then use Local LiveView™ on a computer or other web-enabled device that is connected to the same network.

**IMPORTANT NOTE!** You cannot use Local LiveView to remotely operate the controller from outside the local network. If you want to operate the controller from an external network, you need to use Internet-based LiveView or BaseManager.

1. Plug an Ethernet cable into the Ethernet port on the back of the controller board and plug the other end of the cable into a live Ethernet jack.
2. Perform the steps in Setting Up the Web Server on page 72. Note whether the **Force SSL** field is selected.
3. Perform the steps in Viewing the IP Information Screen on page 71. Write down the number that displays in the **IP Address** field.

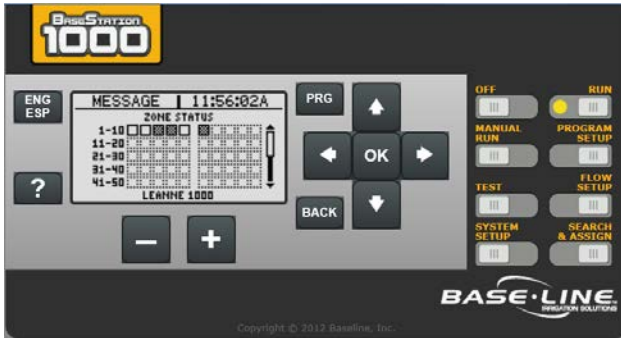
**Example:** 10.11.12.88

4. Start a web browser on a computer or other device that is connected to the local network.
5. In the web browser's address field, perform one of the following procedures:
  - If the **Force SSL** field IS selected, type **HTTPS://**
  - If the **Force SSL** field is NOT selected, type **HTTP://**
6. In the web browser's address field, following either **HTTPS://** or **HTTP://**, type the **IP Address** that you recorded in step 3 of this procedure, and then press **Enter**.

**Example:** **HTTPS://10.11.12.88**

7. Perform one of the following procedures:
  - If you did not require a PIN when you set up the web server, the Local LiveView page for your BaseStation 1000 displays in the browser. Continue with step 8.
  - If you required a PIN when you set up the web server, the browser will prompt you to enter a username and password. Leave the **Username** field as is. Click in the **Password** field, and then type the **PIN**. Click the **OK** button or press **Enter**. The Local LiveView page for your BaseStation 1000 displays in the browser.

8. In the browser, use the mouse to click a button on the Local LiveView interface. All commands issued through LiveView are performed on the controller.



9. When you have finished using Local LiveView, close the browser window to prevent unauthorized users from operating the controller.

## Enabling the BaseManager Connection

The BaseStation 1000 is equipped to connect to BaseManager and Internet-based LiveView™ which makes your controller accessible anytime from anywhere, with any Internet-accessible device. The first step for connecting to BaseManager or Internet-based LiveView is to connect your controller to the Internet through your local network. Refer to Setting Up the Default Network Connection on page 70.

Because Internet-based LiveView is available through Baseline’s BaseManager server, the next step is to perform the procedure below to enable the BaseManager connection.

The final step is to connect to BaseManager. Refer to Connecting to BaseManager on page 75.

1. Make sure that you have performed the steps in Setting Up the Default Network Connection on page 70 and that your DHCP connection is “enabled.”
2. Press the **System Setup** button. The System Setup menu displays.
3. Press the ↓ button to highlight the **Network Setup** option, and then press the **OK** button to select it. The Network Setup menu displays.
4. Press the ↓ button to highlight the **BaseManager Setup** option, and then press the **OK** button to select it. The BaseManager Setup screen displays.
5. Press the + or – button to change the value in the **BaseManager Enabled** field.
  - If BaseManager is currently enabled, a **checkmark displays** in the Enabled field. Press the + or – button to remove the checkmark.
  - If BaseManager is currently disabled, **there is no checkmark** in the Enabled field. Press the + or – button to replace the checkmark.
6. Continue to the Connecting to BaseManager procedure on page 75.



## Using an Alternate IP Address to Connect to BaseManager

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If your organization is hosting a BaseManager server, you will use a different IP address to connect to BaseManager.

1. Make sure that you have performed the steps in Setting Up the Default Network Connection on page 70 and that your DHCP connection is “enabled.”
2. Make sure that you have performed the steps in Enabling the BaseManager Connection on page 72 and that your BaseManager connection is “enabled.”
3. Press the **System Setup** button. The System Setup menu displays.
4. Press the **↓** button to highlight the **Network Setup** option, and then press the **OK** button to select it. The Network Setup menu displays.
5. Press the **↓** button to highlight the **BaseManager Setup** option, and then press the **OK** button to select it. The BaseManager Setup screen displays.
6. Press the **↓** button to move to the **Use Alternate IP** field, and then press the **+ or –** button to change the value in the field.
  - If the alternate IP address is currently enabled, a **checkmark displays** in the field. Press the **+ or –** button to remove the checkmark.
  - If the alternate IP address is currently disabled, **there is no checkmark** in the field. Press the **+ or –** button to replace the checkmark.
7. Press the **↓** button to move to the **IP Address** field (the field displays when Use Alternate IP is enabled). Press the **+ or –** button to change the values in the IP address.

**Note:** To rapidly increase or decrease the value, press and hold the **+** button or the **–** button.
8. Connect to the alternate BaseManager server by performing the steps in the Connecting the Controller to BaseManager procedure.

## Connecting the Controller to BaseManager

---

The BaseStation 1000 is equipped for Internet-based LiveView™ which makes your controller accessible anytime from anywhere, with any Internet-accessible device, just as if you were standing in front of it. The first step for connecting to Internet-based LiveView is to connect your controller to the Internet through your network. Refer to Setting Up the Default Network Connection on page 70.

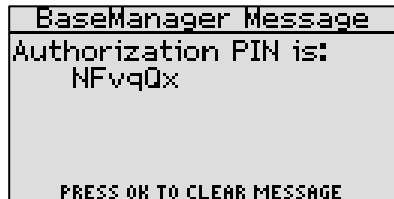
Because Internet-based LiveView is available through Baseline’s BaseManager server, the next step is to enable the BaseManager connection. Refer to Enabling the BaseManager Connection on page 72.

The final step is to connect the controller to BaseManager by performing the steps below.

1. Make sure that the controller is connected to the network. Refer to Viewing the IP Information Screen on page 71. If the controller is not connected, perform one of the following procedures:
  - Enable the DHCP connection by performing the steps in Setting Up the Default Network Connection on page 70.
  - Connect the controller with a static IP address by performing the steps in Setting Up a Static IP Address on page 70.
2. Make sure that you have performed the steps in Enabling the BaseManager Connection on page 72 and that your BaseManager connection is “enabled.”
3. Press the **System Setup** button. The System Setup menu displays.
4. Press the **↓** button to highlight the **Network Setup** option, and then press the **OK** button to select it. The Network Setup menu displays.
5. Press the **↓** button to highlight the **BaseManager Info** option, and then press the **OK** button to select it. The BaseManager Info screen displays.
6. To connect to BaseManager, press the **OK** button. The Status field shows that the controller is connected.



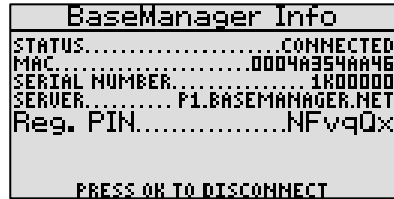
**Note:** When your controller connects to the BaseManager server, the server detects the connection and checks for an associated account. If no account is found, the server sends an authorization/registration PIN to your controller. You might see the PIN displayed on the controller’s main screen as illustrated here, but you can also find the PIN on the BaseManager Info screen. You will use the PIN to create your BaseManager account.



## Viewing BaseManager Information

1. Press the **System Setup** button. The System Setup menu displays.
2. Press the **↓** button to highlight the **Network Setup** option, and then press the **OK** button to select it. The Network Setup menu displays.
3. Press the **↓** button to highlight the **BaseManager Info** option, and then press the **OK** button to select it. The BaseManager Info screen displays.
4. Review the following information:
  - **Status** – Indicates whether the controller is connected to BaseManager

- **MAC** – The Media Access Control address (MAC address) is a unique identifier for your controller.
- **Serial Number** – Your controller’s serial number
- **Server** – If your controller is connected to BaseManager, this field shows the server that the controller is connected to.



**Note:** You can configure the controller to connect to an alternate BaseManager server. Refer to Using an Alternate IP Address to Connect to BaseManager on page 75.

- **Reg. PIN** – When your controller connects to the BaseManager server, the server detects the connection and checks for an associated account. If no account is found, the server sends an authorization/registration PIN to your controller. You will use the PIN to create your BaseManager account.

**Note:** The PIN is case sensitive. When you write down the PIN, be sure to copy the case of each letter exactly as it is displayed.

## Using Internet-based LiveView to Remotely Operate the Controller

---

When your controller is connected to the Internet with an Ethernet cable or another communication method, you can use Internet-based LiveView™ to remotely operate your controller anytime from anywhere, with any Internet-accessible device.

### Prerequisites

- Set up the default network connection (refer to page 70)
  - Enable the BaseManager connection (refer to page 74)
  - Connect the controller to BaseManager (refer to page 75)
1. On the controller, view the BaseManager Info screen (refer to page 76) and write down the web site address (URL) that displays in the **Server** field, and the **registration PIN**.
 

**Note:** The PIN is case sensitive. When you write down the PIN, be sure to copy the case of each letter exactly as it is displayed. You only need the PIN for your initial account creation in BaseManager.
  2. On a computer or other Internet-accessible device, start the Mozilla Firefox or Google Chrome web browser. BaseManager is not compatible with Microsoft’s Internet Explorer web browser.
  3. Type the URL for the BaseManager server in the browser’s address field, and then press **Enter**. The BaseManager login window displays.

4. Perform one of the following:
  - If you are logging into BaseManager for the first time, you need to sign up for a new account. Click the button on the BaseManager Login page, and then fill in all the fields in the wizard.
  - If you already have a BaseManager account, type your username and password in the fields, and then click Login.
5. On the BaseManager page, click the **LiveView** tab.
6. Use the mouse to click a button on the LiveView interface. All commands issued through LiveView are performed on the controller.
7. When you have finished using Internet-based LiveView, close the browser window to prevent unauthorized users from operating the controller.

## Setting Up the Screen Display

---

You can adjust the brightness and contrast on the BaseStation 1000 display screen to provide better visibility in a variety of lighting conditions and to accommodate a variety of viewing angles. You can also set a time limit for the backlight to be turned off.

1. Press the **System Setup** button. The System Setup menu displays.
2. Press the **↓** button to highlight the **Display Setup** option, and then press the **OK** button to select it. The Display Setup screen displays.
3. Press the **+ or –** button to change the number in the **Screen Contrast** field. A lower number indicates less contrast and a higher number indicates more contrast. To rapidly increase or decrease the value, press and hold the **+ button** or the **– button**.

**Note:** You will not see the contrast change when you adjust the screen contrast in LiveView.

4. When the screen contrast appears to be suitable for the conditions, stop changing the number.
5. Press the **↓** button to move to the **Brightness** field, and then press the **+ or –** button to change the number.

**Note:** You cannot increase the value in the Brightness field greater than 100%.
6. Press the **↓** button to move to the **Timeout** field, and then press the **+ or –** button to change the number. This setting enables you to control how long the display remains illuminated before it goes dark.
7. Perform one of the following options:
  - To return to the **System Maintenance** screen, press the **BACK** button.
  - To return the controller to the Run menu, press the **RUN** button.

## Setting Up Security for the Controller

---

In the BaseStation 1000 you can set up the following levels of security access:

- **Admin** – Grants access to all controller functions
- **Programmer** – Grants access to all controller functions except the Security function
- **Operator** – Grants access to the Run menu, the Manual Run menu, and the Test menu

After you enable the security and set up the PINs, restart the controller. Users will be prompted to enter their PIN when they press one of the menu buttons on the controller. If the user does not have access to the menu, he/she will see the message “Invalid PIN.”

**IMPORTANT NOTE!** When a user accesses the controller with a PIN, the controller will maintain that level of access for 1 hour. When that time is up, anyone who tries to use the controller will be prompted to enter a PIN.

1. Press the **System Setup** button. The System Setup menu displays.
2. Press the **↓** button to highlight the **Security Setup** option, and then press the **OK** button to select it. The Security Setup screen displays.
3. Press the **+** button to display a checkmark in the **Enabled** field. The PIN fields for the security levels display.
4. Press the **↓** button to highlight the first digit of the Admin PIN, and then press the **+** or **-** button to change the number.
5. Press the **⇒** button to move to the next digit, and then press the **+** or **-** button to change the number. Repeat this step until you have configured all digits of the PIN.
6. Press the **↓** button to highlight the next PIN, and then repeat steps 5 and 6 until you have configured all of the PINs.



## Clearing the Programming on the Controller

---

This function will clear or erase all programming information from the controller. We recommend that you use this function only as directed by Baseline Support.

**IMPORTANT NOTE!** Never clear your programming data without having a current backup available for a restore. Refer to Backing Up the Controller Programming on page 80.

1. Press the **System Setup** button. The System Setup menu displays.
2. Press the **↓** button to highlight the **Clear Programming** option, and then press the **OK** button to select it. The Clear Programming screen displays.
3. To clear all programming data, press the **+** button.

**Note:** To exit this screen without clearing all programming in the controller, press the **BACK** button.

## Backing Up the Controller Programming

---

The BaseStation 1000 provides the following methods for backing up the controller programming:

- **Backing up to a USB drive** – This method backs up all programming information from the controller to a USB drive (also called a flash drive or a thumb drive). A USB drive is provided for this purpose. We recommend that you use this option if you plan to keep this backup long term. We also recommend that you back up a stable version of your controller’s programming to a USB drive on a regular basis.
- **Backing up to BaseManager** – This method backs up all programming information to the BaseManager server. To use this backup option, you must have a LiveView or BaseManager account.

We recommend that you create a backup before you make significant changes to the programming on your controller. After you verify that the new programming is satisfactory, create a new backup to preserve those changes.

### To back up the controller programming to a USB drive

1. Plug the USB drive into the USB port on the controller.
2. Press the **System Setup** button. The System Setup menu displays.
3. Press the **↓** button to highlight the **Backup & Restore** option, and then press the **OK** button to select it. The Backup & Restore screen displays.
4. The **USB Backup** option should be highlighted. If it is not highlighted, press the **↓** button to highlight it, and then press the **OK** button to select it. The USB Backup screen displays.
5. Press the **+** button to back up the programming data to the USB drive. The controller writes the data to a folder on the USB drive that is named with the controller’s serial number.
6. When the controller has finished writing the backup file, unplug the USB drive from the USB port on the controller.

### To back up the controller to BaseManager

**IMPORTANT NOTE!** Registered BaseManager users can restore their controller data from the BaseManager backup. LiveView users can create a BaseManager backup but cannot restore from this backup.

1. Press the **System Setup** button. The System Setup menu displays.
2. Press the **↓** button to highlight the **Backup & Restore** option, and then press the **OK** button to select it. The Backup & Restore screen displays.
3. Press the **↓** button to highlight the **BaseManager Backup** option, and then press the **OK** button to select it. The BaseManager Backup screen displays.
4. Press the **+** button to back up the programming data to the BaseManager server.

## Restoring the Controller Programming

This function restores all programming information in the controller from a backup that you made. We recommend that you use this function only as directed by Baseline Support.

**IMPORTANT NOTE!** Remember that the BaseStation 1000 provides multiple methods for backing up the controller programming. If you backed up your programming to a USB drive, you will restore from that same USB drive. If you backed up to the BaseManager server and you are a registered BaseManager user, you will restore from the BaseManager backup.

### To restore the controller programming from a USB drive backup

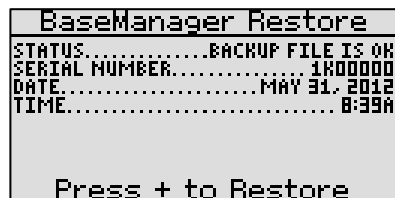
1. Plug the USB drive that has the backup file on it into the USB port on the controller.
2. Press the **System Setup** button. The System Setup menu displays.
3. Press the **↓** button to highlight the **Backup & Restore** option, and then press the **OK** button to select it. The Backup & Restore screen displays.
4. Press the **↓** button to highlight the **USB Restore** option, and then press the **OK** button to select it. The USB Restore screen displays.
5. Verify that the date and time listed for the USB backup match the programming that you want to restore.
6. Press the **+** button to restore the programming data from the backup stored on the USB drive.
7. When the controller has finished restoring the programming from the backup file, unplug the USB drive from the USB port on the controller.



### To restore the controller programming from a BaseManager backup

**IMPORTANT NOTE!** A registered BaseManager user can restore his or her controller from the BaseManager backup. LiveView users can create a BaseManager backup but cannot restore from that backup.

1. Press the **System Setup** button. The System Setup menu displays.
2. Press the **↓** button to highlight the **Backup & Restore** option, and then press the **OK** button to select it. The Backup & Restore screen displays.
3. Press the **↓** button to highlight the **BaseManager Restore** option, and then press the **OK** button to select it. The BaseManager Restore screen displays.
4. Verify that the date and time listed for the local backup match the programming that you want to restore.
5. Press the **+** button to restore the programming data from the backup stored on the BaseManager server.



## Updating the Firmware on the Controller

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Firmware updates are free for the life of any Baseline controller as long as the hardware is compatible. Baseline will periodically release firmware upgrades that enhance the usefulness of our products or fix the occasional bug.

There are two methods for getting the firmware update for your controller:

- **From the Baseline web site with a USB drive** – Use this method when your controller is **not connected** to the Internet. You will need a computer with a USB port. This computer must have access to the Internet. You also need a USB drive. You download the firmware from the Baseline web site to the USB drive. Then, you take the USB drive to the controller and install the update.
- **From BaseManager** – Use this method when your controller is **connected** to the Internet. You can install the firmware update directly from BaseManager to your controller.

We recommend that you back up your current configuration before starting this process in case you need to restore your system. Refer to Backing Up the Controller Programming on page 80.

### To update the controller's firmware from the Baseline web site

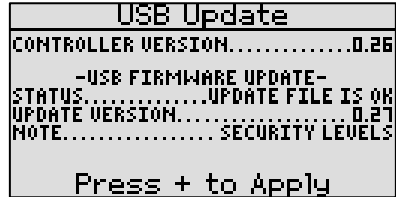
**Note:** The following procedure assumes that your computer is running Microsoft Windows.

1. Download the firmware from the Baseline web site.
  - a. Plug a USB drive into a USB port on a computer that is connected to the Internet.
  - b. Go to the Baseline web site at the following URL:  
[www.baselinesystems.com](http://www.baselinesystems.com)
  - c. On the home page, click **Support**.
  - d. In the left navigation bar, click **Firmware Version Updates**.
  - e. Click the **BaseStation 1000** tab.
  - f. Click the button to download the firmware upgrade.
  - g. When prompted, choose the **Save As** option. The Save As dialog box displays.
  - h. Find the USB drive in the list of drives and folders, and then double-click to select it.
  - i. Click **Save**.
  - j. Close the Windows Explorer window for the USB drive.
  - k. In the System Tray area of your Windows Desktop, click the option to **Safely Remove Hardware and Eject Media**.
  - l. When the **Safe to Remove Hardware** message displays, unplug the USB drive from the computer.
2. Update the firmware on the controller.
  - a. On the BaseStation 1000 controller, plug the USB drive that has the Update file on it into the USB port.



- b. Press the **System Setup** button. The System Setup menu displays.
- c. Press the **↓** button to highlight the **Firmware Update** option, and then press the **OK** button to select it. The Firmware Update menu displays.
- d. The **USB Update** option should be highlighted. If it is not highlighted, press the **↓** button to highlight it, and then press the **OK** button to select it. The USB Update screen displays.

The controller reads the contents of the USB drive and displays the update information in the Status field. When the update file is available, the status line reads "Update File is OK."



- e. Press the **+** button to apply the update. When the update is complete, the controller restarts and briefly displays the new firmware version.
- f. Unplug the USB drive from the port on the controller.

## To update the controller's firmware from BaseManager

When your controller is connected to the Internet, you can install the firmware update directly from BaseManager.

1. Verify that your controller is connected to BaseManager. Refer to Viewing BaseManager Info on page 76.
2. Press the **System Setup** button. The System Setup menu displays.
3. Press the **↓** button to highlight the **Firmware Update** option, and then press the **OK** button to select it. The Firmware Update menu displays.
4. Press the **↓** button to highlight the **BaseManager Update** option, and then press the **OK** button to select it. The BaseManager Update screen displays.

If an update is available from BaseManager, the controller displays the information on the BaseManager Update screen.

5. Press the **+** button to apply the update. When the update is complete, the controller restarts and briefly displays the new firmware version.

## Exporting Data from the Controller

The BaseStation 1000 controller keeps a record of all changes made to the controller and all actions that occur on the controller. Because these logs are stored in the controller's internal memory, they are somewhat limited in scope, but they can still prove useful for tracking configuration changes or program start/stop times.

1. Plug a USB drive into the USB port on the controller.
2. Press the **System Setup** button. The System Setup menu displays.

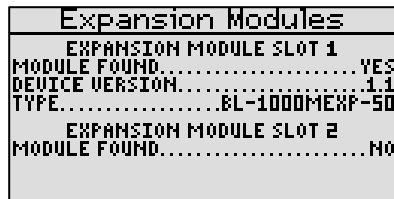
3. Press the **↓** button to highlight the **Export Data** option, and then press the **OK** button to select it. The Export Data screen displays.
4. Press the **↓** button to highlight the type of data that you want to export, and then press the **OK** button.
5. Unplug the USB drive from the USB port on the controller. When you plug the USB drive into a computer, you will find the exported files on the USB drive in a folder labeled with the controller's serial number.



## Adding Expansion Modules

If you purchase an expansion module for your controller, install the module onto the controller board as directed in the installation guide. Use the following steps to verify that the controller recognizes the module.

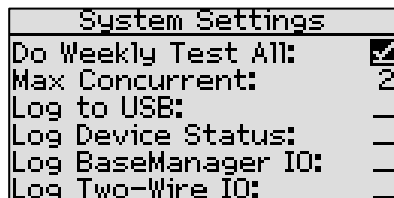
1. Press the **System Setup** button. The System Setup menu displays.
2. Press the **↓** button to highlight the **Expansion Modules** option, and then press the **OK** button to select it. The Expansion Modules screen displays.
3. Verify that the controller finds the expansion module as shown in this screen illustration.



## Enabling or Disabling the Weekly Test All

By default, the controller is configured to run a weekly test on all solenoids starting at midnight on Saturday. The test pauses all irrigation until it is complete. If this test interferes with your watering schedule, you can disable the test.

1. Press the **System Setup** button. The System Setup menu displays.
2. Press the **↓** button to highlight the **System Settings** option, and then press the **OK** button to select it. The System Settings screen displays.
3. Perform one of the following actions in the **Do Weekly Test All** field:



- **Disable the test:** If the weekly test is currently enabled, a **checkmark displays** in the Do Weekly Test All field. Press the + or – button to remove the checkmark.
- **Enable the test:** If the weekly test is currently disabled, there is **no checkmark** in the Do Weekly Test All field. Press the + or – button to replace the checkmark.

## Enabling Diagnostics for Baseline Support

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If you are working with Baseline Support to troubleshoot a problem on your controller, the support specialist may ask you to enable additional diagnostic logs that will help track down the problem.

1. Press the **System Setup** button. The System Setup menu displays.
2. Press the **↓** button to highlight the **System Settings** option, and then press the **OK** button to select it. The System Settings screen displays.
3. Perform any of the following actions as directed by Baseline Support:
  - **Copy the full event log to a USB drive:** Plug a USB drive into the USB port on the controller. Press the **↓** button to move to the **Log to USB** field, and then press the **+ or –** button to put a checkmark in the field. The support specialist will indicate how long you need to leave the USB drive plugged in
  - **Capture the status of all connected devices:** Press the **↓** button to move to the **Log Device Status** field, and then press the **+ or –** button to put a checkmark in the field.
  - **Capture all BaseManager communication:** Press the **↓** button to move to the **Log BaseManager IO** field, and then press the **+ or –** button to put a checkmark in the field.
  - **Capture all two-wire communication:** Press the **↓** button to move to the **Log Two-Wire IO** field, and then press the **+ or –** button to put a checkmark in the field.

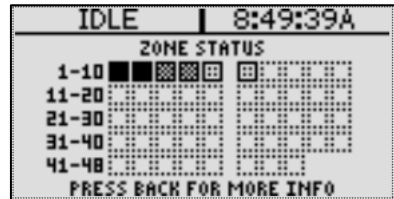
## 9 – Status Reports & Messages

The main screen shows information about the operating state of the BaseStation 1000 controller. The controller provides the following categories of reports and each category can have multiple reports.

- Zone Status
- Program Status
- Flow and Master Valve/Pump Status
- Running Zones
- Operator Messages
- Rain Delay
- Event Days
- System Status

### Viewing the Zone Status Report







1. When the controller is in the Run menu, the Zone Status report typically displays on the screen. If you do not see “ZONE STATUS” and the list of zones, press the **RUN** button to make sure that the controller is in the Run menu, and then press the **BACK** button to display the Status Report menu.
2. The **Zone Status** option should be highlighted. If it is not, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Zone Status screen displays.
3. To return to the Status Report menu, press the **BACK** button.



### Understanding Zone Statuses

The following icons identify the status of the zones:

Icon	Status	Description
	Unassigned	The zone does not have a biCoder assigned to it
	Idle (Done)	The complete cycle has finished for this zone – including watering and soaking

	Waiting	The zone is scheduled to run, but currently it is not watering or soaking
	Watering	Watering is in progress
	Soaking	The zone has watered and is now soaking
	Paused	A pause condition is in effect for this zone
	Disabled	The zone is marked as being disabled
	Message	There is a message associated with this zone




## Viewing the Program Status Report





1. Press the **RUN** button.
2. Press the **BACK** button. The Status Report menu displays.
3. Press the **↑** or **↓** button to highlight **Program Status**, and then press the **OK** button. The Program Status screen displays.
4. Press the **↓** button to view the detailed status for individual programs.
5. To return to the Status Report menu, press the **BACK** button.



## Understanding Program Statuses

The following icons identify the status of the programs:

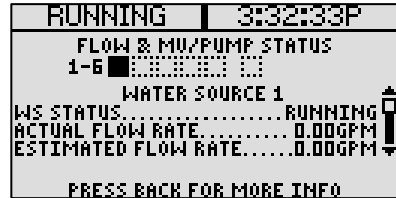
Icon	Status	Description
	Idle (Done)	The complete cycle has finished for this program – including watering and soaking
	Waiting	The program is scheduled to run, but currently it is not watering or soaking
	Watering	Watering is in progress

	Soaking	A zone associated with this program has watered and is now soaking
	Paused	A pause condition is in effect for this program
	Disabled	The program is marked as being disabled
	Message	There is a message associated with this program

## Viewing the Flow and Master Valve/Pump Status Report

1. Press the **RUN** button.
2. Press the **BACK** button. The Status Report menu displays.
3. Press the **↑** or **↓** button to highlight **Flow & MV/Pump Status**, and then press the **OK** button. The Flow Status and MV/Pump Status screen displays.






Icons representing the MVs and pump start devices are listed at the top of the screen. One water source is identified below with the flow rate readings in gallons per minute (GPM).



4. To view the report for the next water source, press the **↓** button.
5. To return to the Status Report menu, press the **BACK** button.

## Understanding MV/Pump Statuses

The following icons identify the status of the master valves and pump start devices:

Icon	Status	Description
	Unassigned	The MV/pump does not have a biCoder assigned to it
	Idle (Done)	The complete cycle has finished for this MV/pump – including watering and soaking
	Watering	Watering is in progress
	Disabled	The MV/pump is marked as being disabled
	Message	There is a message associated with this MV/pump

## Viewing the Running Zones Report

1. Press the **RUN** button.
2. Press the **BACK** button. The Status Report menu displays.
3. Press the **↑** or **↓** button to highlight **Running Zones**, and then press the **OK** button. The Running Zones screen displays.

Any running zones are listed along with a countdown timer of the remaining runtime. When programs are finished, the report displays "No Running Zones."

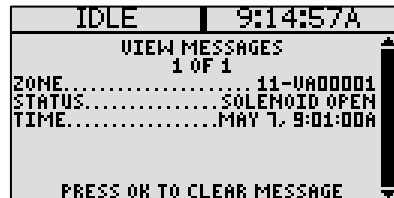


4. To return to the Status Report menu, press the **BACK** button.

## Viewing Operator Messages

1. Press the **RUN** button.
2. Press the **BACK** button. The Status Report menu displays.
3. Press the **↑** or **↓** button to highlight **View Messages**, and then press the **OK** button. The View Messages screen displays.

**Note:** Messages notify you when something in your system needs your attention, such as an open solenoid or no response from a device. When your system is operating as expected, the View Messages screen indicates that there are no messages.



4. Perform any of the following options:
  - If the controller indicates that there are multiple messages, press the **↓** button to display each message.
  - If you no longer need the message, press the **OK** button to clear it.
5. To return to the Status Report menu, press the **BACK** button.

## Enabling Start, Pause, and Stop Messages

The controller can display a message when a program starts, stops, or pauses. You can enable or disable these messages at your discretion. By default, the messages are disabled.

### To display a message when a program starts

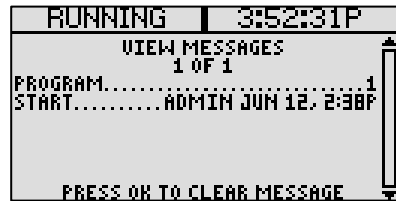
1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to enable the message for displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to enable the message for displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

3. Press the ↓ button to highlight the **Setup Prg. Start** option, and then press the **OK** button. The Setup Prg. Start screen displays the list of start conditions.

**Note:** For information about configuring the fields on the Setup Prg. Start screen, refer to Setting a Start Condition for a Program on page 37.

4. Press the ↓ button to highlight the **Display Message** option, and then press the + button to display a checkmark in the field.
5. To view the message, perform the steps in Viewing Operator Messages on page 89.



### To display a message when a program pauses

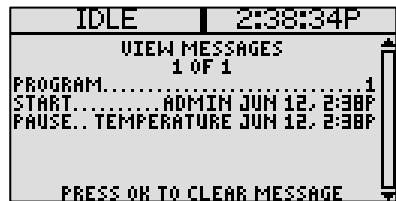
1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to enable the message for displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to enable the message for displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

3. Press the ↓ button to highlight the **Setup Prg. Pause** option, and then press the **OK** button. The Setup Prg. Pause screen displays.

**Note:** For information about configuring the fields on the Setup Prg. Pause screen, refer to Setting a Pause Condition for a Program on page 47.

4. Press the ↓ button to highlight the **Display Message** option, and then press the + button to display a checkmark in the field.
5. To view the message, perform the steps in Viewing Operator Messages on page 89.





## To display a message when a program stops

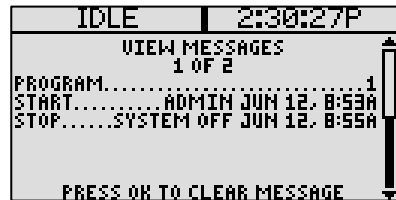
1. Press the **Program Setup** button. The Program Setup menu displays.
2. If the program that you want to enable the message for displays in the upper-left corner of the screen, continue to step 3. Otherwise, press the **PRG** button until the program that you want to enable the message for displays in the upper-left corner of the screen.

**Note:** To move backwards in the list of programs, press and hold the PRG button, and then press the – button repeatedly.

3. Press the ↓ button to highlight the **Setup Prg. Stop** option, and then press the **OK** button. The Setup Prg. Stop screen displays.

**Note:** For information about configuring the fields on the Setup Prg. Stop screen, refer to Setting a Stop Condition for a Program on page 49.

4. Press the ↓ button to highlight the **Display Message** option, and then press the + button to display a checkmark in the field.
5. To view the message, perform the steps in Viewing Operator Messages on page 89.



## Viewing Moisture Graphs

1. Press the **RUN** button.
2. Press the **BACK** button. The Status Report menu displays.
3. Press the ↑ or ↓ button to highlight **View Graphs**, and then press the **OK** button. The moisture graph for sensor 1 displays. The date range displays on the horizontal axis of the graph and the moisture percentage displays on the vertical axis.
4. Perform either of the following actions:
  - To display the graph for a different soil moisture sensor, press the ↑ or ↓ button.
  - To change the date range, press the + or – button.

## Viewing the System Status Report

---

1. Press the **RUN** button.
2. Press the **BACK** button. The Status Report menu displays.
3. Press the **↑** or **↓** button to highlight **System Status**, and then press the **OK** button. The System Status screen displays.
  - Two-wire voltage
  - Two-wire current
  - The internal temperature of the controller
4. To return to the Status Report menu, press the **BACK** button.

<b>IDLE</b>	<b>8:16:30A</b>
<b>SYSTEM STATUS</b>	
TWO-WIRE VOLTAGE.....30.7V/31.4V	
TWO-WIRE CURRENT.....0.11A/0.05A	
CONTROLLER TEMPERATURE.....31.5C	

# 10 – Testing Devices

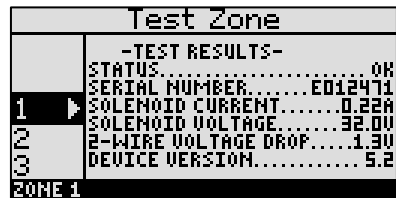
The BaseStation 1000 has built-in features for testing zones, valves, biCoders and biSensors. These tests help you isolate and identify components and devices that are not working properly so you know what needs to be repaired.

## Testing Zones, Valves, and biCoders

When you test a zone, the controller verifies the communication between the controller and the valve biCoder. The controller activates the solenoid and measures the current and voltage. It deactivates the solenoid, and measures the voltage drop between the controller and the valve biCoder.

1. Press the **Test** button. The Test menu displays.
2. If the **Test Zone** option is highlighted, press the **OK** button to select it. If Test Zone is not highlighted, press the **↑** or **↓** button to highlight it, and then press the **OK** button. The Test Zone screen displays.
3. Press the **↑** or **↓** button to select the zone number that you want to test.
4. Press the **OK** button to test the zone.

The valve will activate for less than a second to measure the voltage and current through the valve solenoid. This test will return the status of the valve, the biCoder serial number, the solenoid current, the solenoid voltage, the two-wire voltage drop, and the version of the two-wire device. If any zones or programs are running when the test is activated, watering will pause for 10 minutes.



5. Repeat steps 3 and 4 until you have tested all the zones that you wish to test.
6. When you have finished viewing the test results, press the **RUN** button to return to the Run menu.

Refer to the following table for possible self-test statuses along with causes and suggestions for resolving the issues.

Self-test status	Causes/Action
Open circuit	<ul style="list-style-type: none"> <li>• Wire connection between the valve biCoder and the valve solenoid is broken – repair wire connections.</li> <li>• Valve solenoid is broken – replace solenoid.</li> </ul>

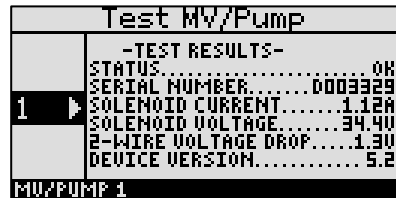
- |               |  |
|---------------|--|
| Short circuit | <ul style="list-style-type: none"> <li>• Wire connection between the valve biCoder and the valve solenoid is shorted together – repair wire connections.</li> <li>• Valve solenoid is broken – replace solenoid.</li> </ul>  |
| No response   | <ul style="list-style-type: none"> <li>• Two-wire connection to the valve biCoder is broken – repair wire and connections to the valve biCoder.</li> <li>• Two-wire voltage loss is too high – check other devices in same vicinity for high two-wire voltage loss – repair high resistance connections between controller and devices.</li> <li>• Valve biCoder is damaged – remove biCoder and move it directly to the controller to test its ability to communicate.</li> <li>• Do a device search to repair any address problems.</li> </ul> |

## Testing Master Valve and Pump Devices

When you test a master valve and/or pump device, the controller verifies the communication between the controller and the device. The controller activates the solenoid and measures the current and voltage. It deactivates the solenoid, and measures the voltage drop between the controller and the device.

1. Press the **Test** button. The Test menu displays.
2. Press the **↑** or **↓** button to highlight the **Test MV/Pump** option, and then press the **OK** button. The Test MV/Pump screen displays.
3. Press the **↑** or **↓** button to select the master valve and/or pump device number that you want to test.
4. Press the **OK** button to test the master valve and/or pump device.

The device will activate for less than a second to measure the voltage and current through the solenoid. This test will return the status of the device, the device serial number, the solenoid current, the solenoid voltage, the two-wire voltage drop, and the version of the two-wire device. If any zones or programs are running when the test is activated, watering will pause for 10 minutes.



5. Repeat steps 3 and 4 until you have tested all the master valve and/or pump devices that you wish to test.
6. When you have finished viewing the test results, press the **RUN** button to return to the Run menu.

## Testing Soil Moisture Sensors (biSensors)

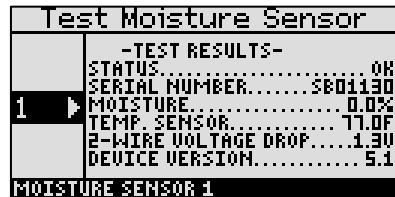
When you test a soil moisture sensor (biSensor), the controller verifies the communication between the controller and the biSensor and returns the following readings:

- The status of the biSensor
- The biSensor serial number
- The current soil moisture percentage value
- The soil temperature from the sensor in degrees Fahrenheit
- The two-wire voltage drop (a measure of the wire length and quality between the controller and the biSensor)

**Note:** Voltage drops greater than 5 volts should be repaired.

- The version of the biSensor
1. Press the **Test** button. The Test menu displays.
  2. Press the **↑** or **↓** button to highlight the **Test Moisture Sensor** option, and then press the **OK** button. The Test Moisture Sensor screen displays.
  3. Press the **↑** or **↓** button to select the moisture sensor number that you want to test.
  4. Press the **OK** button to test the moisture sensor.
 

**Note:** If any zones or programs are running when the test is activated, watering will pause for 10 minutes.
  5. Repeat steps 3 and 4 until you have tested all the moisture sensors that you wish to test.
  6. When you have finished viewing the test results, press the **RUN** button to return to the Run menu.



Refer to the following table for possible self-test statuses along with causes and suggestions for resolving the issues.

Self-test status	Causes/Action
No reply	<ul style="list-style-type: none"> <li>• Two-wire connection to the biSensor is broken – repair the wire and connections to the biSensor.</li> <li>• Two-wire voltage loss is too high – check other devices in same vicinity for high two-wire voltage loss – repair high resistance connections between the controller and devices.</li> <li>• The biSensor is damaged – remove the biSensor and connect it directly to the controller to test its ability to communicate.</li> </ul>

- Zero reading
- The biSensor detection blade is damaged – if the soil temperature reading is valid, replace the biSensor.

If the following conditions occur in the area where the biSensor is buried, you might get unusual or inaccurate readings from the biSensor. Review these conditions along with causes and suggestions for resolving the issues.

Condition	Causes/Action
Ground is too dry with low biSensor moisture reading	<ul style="list-style-type: none"> <li>• Not enough zone water time – increase water time to apply at least ½ inch of water</li> <li>• biSensor not being watered by its primary zone – change the assignment or move the biSensor to the correct location</li> <li>• Program start times are too infrequent – increase the program start time frequency</li> <li>• biSensor limit is too low – raise limit or run a biSensor calibration cycle</li> </ul>
Ground is too dry with high biSensor moisture reading	<ul style="list-style-type: none"> <li>• biSensor not being watered by its primary zone – change the assignment or move the biSensor to the correct location</li> <li>• biSensor is buried too deep – rebury the biSensor to be only 3 inches deep</li> </ul>
Ground is too wet with high biSensor moisture reading	<ul style="list-style-type: none"> <li>• biSensor is buried in low area where water collects – move biSensor from low area</li> <li>• biSensor not being watered by its primary zone – change the assignment or move the biSensor to the correct location</li> <li>• Program start times are too often – increase the interval between start times</li> <li>• biSensor limit is too high – lower limit or run a biSensor calibration cycle</li> </ul>
Ground is too wet with low biSensor moisture reading	<ul style="list-style-type: none"> <li>• biSensor not being watered by its primary zone – change the assignment or move the biSensor to the correct location</li> <li>• biSensor is buried too deep – rebury the biSensor to be only 3 inches deep</li> <li>• Not enough zone water time – increase water time to apply at least ½ inch of water</li> </ul>

## Testing Flow Sensors

1. Press the **Test** button. The Test menu displays.
2. Press the **↑** or **↓** button to highlight the **Test Flow Sensor** option, and then press the **OK** button. The Test Flow Sensor screen displays.
3. Press the **↑** or **↓** button to select the flow sensor number that you want to test.
4. Press the **OK** button to test the flow sensor.

This test returns the status of the flow sensor, the flow sensor serial number, the flow rate, the total water usage, the two-wire voltage drop, and the version of the device. If any zones or programs are running when the test is activated, watering will pause for 10 minutes.

Test Flow Sensor	
	-TEST RESULTS-
	STATUS..... OK
	SERIAL NUMBER..... 00W0268
1	▶ FLOW RATE..... 0.00
	TOTAL USAGE..... 1.0 GAL
	2-WIRE VOLTAGE DROP..... 1.2V
	DEVICE VERSION..... 5.0
FLOW SENSOR 1	

5. Repeat steps 3 and 4 until you have tested all the flow sensors that you wish to test.
6. When you have finished viewing the test results, press the **RUN** button to return to the Run menu.

## Testing Event Switches

1. Press the **Test** button. The Test menu displays.
2. Press the **↑** or **↓** button to highlight the **Event Switch** option, and then press the **OK** button. The Test Event Switch screen displays.
3. Press the **↑** or **↓** button to select the event switch number that you want to test.
4. Press the **OK** button to test the event switch.

This test returns the status of the device, the device serial number, the switch state, the two-wire voltage drop, and the version of the device. If any zones or programs are running when the test is activated, watering will pause for 10 minutes.

Test Event Switch	
	-TEST RESULTS-
	STATUS..... OK
	SERIAL NUMBER..... P00016
1	▶ SWITCH STATE..... CLOSED
	2-WIRE VOLTAGE DROP..... 1.2V
	DEVICE VERSION..... 5.0
EVENT SWITCH 1	

5. Repeat steps 3 and 4 until you have tested all the event switches that you wish to test.
6. When you have finished viewing the test results, press the **RUN** button to return to the Run menu.

## Testing Air Temperature Sensors

1. Press the **Test** button. The Test menu displays.
2. Press the **↑** or **↓** button to highlight the **Test Temp. Sensor** option, and then press the **OK** button. The Test Temp. Sensor screen displays.
3. Press the **↑** or **↓** button to select the air temperature sensor number that you want to test.
4. Press the **OK** button to test the air temperature sensor.

This test returns the status of the device, the device serial number, the air temperature, the two-wire voltage drop, and the version of the device. If any zones or programs are running when the test is activated, watering will pause for 10 minutes.

Test Temp. Sensor	
	-TEST RESULTS-
	STATUS.....OK
	SERIAL NUMBER.....00T1053
1	TEMPERATURE.....71.9F
	2-WIRE VOLTAGE DROP.....1.20
	DEVICE VERSION.....5.0
TEMPERATURE SENSOR 1	

5. Repeat steps 3 and 4 until you have tested all the air temperature sensors that you wish to test.
6. When you have finished viewing the test results, press the **RUN** button to return to the Run menu.

## Testing the Two-Wire

1. Press the **Test** button. The Test menu displays.
2. Press the **↑** or **↓** button to highlight the **Test Two-Wire** option, and then press the **OK** button. The Test Two-Wire screen indicates that the test is in progress.

The test results display on the screen.

Test Two-Wire	
	-TEST RESULTS-
	STATUS.....OK
	TWO-WIRE VOLTAGE.....31.60/34.70
	TWO-WIRE CURRENT.....0.02A/0.05A
	CONTROLLER TEMPERATURE.....32.8C
	DEVICE VERSION.....5.10
	TYPE.....14.202



## Testing All Devices

---

Before you begin troubleshooting a problem, run a Test All Devices from the Test menu. This test checks all the devices on the two-wire and displays a summary screen of the results.

If the test finds errors with the devices, the error count is listed for each device type. This test verifies communication and valve currents, biSensor readings, and other device readings, but it does not make any repairs.

1. Press the **Test** button. The Test menu displays.
2. Press the **↑** or **↓** button to highlight the **Test All Devices** option, and then press the **OK** button. The Test All Devices screen displays and the test begins.

If any zones or programs are running when the test is activated, watering will pause for 10 minutes.

When the test finishes, the results display. If any errors are reported, you can view them in the list of messages. Refer to Viewing Operator Messages on page 89.

Test All devices	
-Test Results-	
Zones.....	2 Errors
Moisture Sensors.....	OK
Flow Sensors.....	OK
Event Switches.....	OK
Temp. Sensors.....	OK

## Troubleshooting the Two-Wire: High Current or Shorted

---

The first step in troubleshooting the two-wire is to isolate what works from what does not work. A complex system with many branches in the two-wire path can be difficult to troubleshoot while everything is interconnected. When a short can be isolated to a single segment of the two-wire system, or to a single component, it becomes much easier to fix the problem.

In order to isolate the short, you must physically disconnect two-wire segments and components from the system in a logical manner. Then you can add the two-wire segments and components one at a time in order to isolate the problem.

As you approach problem solving situations, separate problems into the following categories:

- It has never worked.
- It worked before and now it does not.

For problems that fall into the second category, find out what has changed because these factors might provide some insight or a place to start looking for solutions.

- Begin by disconnecting half of the two-wire.
- Next, determine whether the system is running properly with just half of the two-wire connected. If it is, you know that the short is in the other half of the two-wire. If the system does not run properly, you know that the problem is in the half of the two-wire that is connected.
- After you have isolated the short to a half of the two-wire, you can start breaking connections, one at a time, in order to isolate exactly where the problem is.

- After you isolate the short, you need to find out what changed recently that may have caused the problem.
  - Is there the possibility of lightning damage?
  - Any recent work done on the site that could have damaged the buried wire?
- If there is no apparent damage to the two-wire, start disconnecting devices, one at a time, from the shorted segment until the problem goes away.
- After the short has been diagnosed as either damage to the wire or a faulty device, repair or replace it.
- Reconnect components on the repaired two-wire segment. Verify that that adding these components does not cause additional failures.
- Connect other two-wire segments, verifying correct operation as each is connected.

## **Troubleshooting: Lost Devices | No Reply**

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Begin by walking the two-wire and checking for what has changed that may have caused the communication errors.

- Is there just one communication error or is there a group of them?
  - If there is more than one, are they all on the same wire? The same physical area?
  - If this is the case, check the connections and wiring in that area of the two-wire.
- Repeat as necessary

## **Troubleshooting: Over Current Message**

---

If the controller displays an Over Current message, all watering stops and you cannot use the controller until you resolve the problem that is causing the over current.

Over current (also known as excess current) is a situation where a greater-than-intended electric current is supplied due to short circuits, excessive load, and/or incorrect design. The controller also displays an Over Current message when there is an issue with the circuit board.

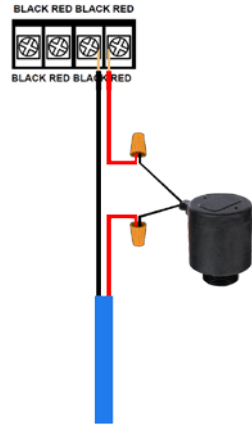
Before you spend time troubleshooting the two-wire and the attached devices, you should eliminate the possibility of a circuit board issue.

### **Diagnosing a Circuit Board Issue**

1. Disconnect the two-wire from the controller.
2. Check the controller to determine whether the Over Current message redisplay.
3. If the message redisplay, you have confirmed a circuit board issue. Contact Baseline Support at 866-294-5847.

## Troubleshooting with a Milliamp Clamp Meter

1. Wire a solenoid in line with the red wire of the two-wire path right after the controller as illustrated here.
2. Use the milliamp clamp meter to take a milliamps ac reading on the red wire (two-wire) that is connected to the controller. Write down this reading, which will be referred to as the “over-current reading.”
3. Go to the first wire splice and use the milliamp clamp meter to take a reading on all red wires (two-wire). As you take the readings, look for a number that is close to the over-current reading.



**Note:** The reading does not have to be identical.

4. Continue testing all red wires on the two-wire path, looking for the over-current reading until you isolate a wire segment or device that is generating that number.
5. Remove the suspected device from the two-wire path, and then check the controller again.
6. Perform one of the following actions:
  - If the Over Current message persists, check the two-wire in that stretch for damage.
  - If the Over Current message goes away, remove the two-wire path and connect the device directly to the controller. If the Over Current message returns, the device is faulty and will need to be replaced.

## Troubleshooting Manually

If you do not have a milliamp clamp meter, you can manually break the two-wire connections in a systematic manner to isolate a wire segment or device that is generating the Over Current message.

1. Determine the approximate halfway point of the two-wire path, and then break the connection at that valve box.
2. Check the controller again. Perform one of the following actions:
  - If the Over Current message persists, the problem is in the half of the two-wire that is still connected to the controller. Find the halfway point of that segment and start at step 1 again.
  - If the Over Current message goes away, the problem is in the disconnected half of the two-wire path. Reconnect the two-wire path, and then disconnect at the halfway point of the problem section. Start at step 1 again.
3. When you have isolated the device or the stretch of two-wire where the problem seems to be originating, remove the two-wire path and connect the device directly to the controller. If the Over Current message returns, the device is faulty and will need to be replaced.

# 11 – Appendix

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## Warranty

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Baseline warrants to the original consumer purchaser that new BaseStation 1000 Series controller as well as the 12 and 24 valve biCoders will be free from defects in material and workmanship for the Standard One Year Warranty Period. The Baseline biSensor™ as well as 1, 2 and 4 valve biCoders will be free of defects in material and workmanship for a Five Year Warranty Period. The start of the warranty period is the date of installation of the system or component. For replacement irrigation components, the warranty on the replacement component is the remainder of the warranty on the original component, or 90 days, whichever is longer.

If you discover a defect, contact your Baseline product installer, or Baseline Inc.

Baseline will, at its option, repair or replace the component at no charge to the customer, provided it is returned during the warranty period, with transportation charges prepaid, to Baseline Inc. in Boise, Idaho. Baseline will pay return shipping of its choice. BaseStation controllers and displays must be properly packaged in the original packaging or in Baseline approved packaging to obtain warranty service.

For warranty service, contact Baseline at 1-866-294-5847 to obtain a "Return Material Authorization" (RMA) number. A copy of the receipt or a bill of sale bearing the appropriate Baseline serial number and model number may be required for warranty service. Warranty Exclusions: normal wear and tear, abuse, unreasonable use, mistreatment, or neglect. Damage caused during installation or incorrect installation, damage caused by modification or repair not made or authorized by Baseline whose Manufacturer's Serial Number and/or Material Number label have been removed, torn or defaced, damage caused by use of non-Baseline packaging, damage caused by improper or improperly used packaging.

THIS WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHERS, WHETHER ORAL OR WRITTEN, EXPRESSED OR IMPLIED. BASELINE SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND AGAINST INFRINGEMENT. No Baseline dealer, agent or employee is authorized to make any modification, extension or addition to this warranty.

BASELINE IS NOT RESPONSIBLE FOR SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY, OR UNDER ANY OTHER LEGAL THEORY, INCLUDING BUT NOT LIMITED TO LOSS OF DATA, LOSS OF PROFITS, DOWNTIME, GOODWILL, DAMAGE OR REPLACEMENT OF EQUIPMENT AND PROPERTY.

Some states do not allow the exclusion or limitation of incidental or consequential damages or exclusions of implied warranties, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may have other rights that vary from state to state. A five-year extended Warranty will be available on the controller pending submission and approval of Baseline's extended warranty application.

## Tips for Setting Up Common Configurations

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### Lower Threshold (Lower Limit) Moisture Sensor Based Watering

Baseline recommends this configuration as a general watering strategy.

**Note:** The steps for this configuration are outlined below. A more detailed procedure is available under Advanced Programming in the Resource Library on the Baseline website.

1. Install the soil moisture sensor in the landscaping according to the instructions that came with the device.
2. In the BaseStation 1000, search for and assign the sensor. Refer to Searching For and Assigning Soil Moisture Sensors on page 27.
3. Set up the soil moisture sensor and assign that sensor to the zone that will water it. Refer to Setting Up Moisture Sensors on page 27.
4. Assign the zones in the area that is monitored by the sensor to a program by giving the zones runtimes. Make sure the runtime is sufficient to lay down  $\frac{1}{2}$ " to  $\frac{3}{4}$ " water. Refer to Setting Up Zone Runtimes for a Program on page 36.
5. Set a **Moisture Start** condition for the program. Refer to the topic on setting up a moisture start condition on page 39.

- a. To manually set the limit, press the + or – button to change the number in the field. Set the limit halfway between field capacity and maximum allowed depletion so there is no stress to the plant material when a day is skipped.

**Note:** To have the controller set the limit based on a calibration, leave the default settings in the Limit field, and then enable the calibration as described in step d. below.

- b. Select **Less Than Limit** start.

- c. Select **Only on Day & Time**.

- Start every day if possible.
- Set start time as desired.

- d. Press the  $\Downarrow$  button to highlight the **Calibration** field.

- If the calibration has not been enabled, the **Start?** option displays on the right side of the screen. To start the calibration, highlight the **Start?** option, and then press the **OK** button.
- If the calibration has been enabled, the **Stop?** option displays on the right side of the screen. To stop the calibration, highlight the **Stop?** option, and then press the **OK** button.

**Note:** When you enable calibration, the process either starts immediately or at the next day and time start. The program puts down 150% of the required water and then waits for 24 hours. The calibration reading is taken when the soil moisture is at field capacity. After the calibration cycle runs one time, it is disabled in the controller.

6. Set up the **Soak Cycles** for the program. Refer to Setting Up Soak Cycles for a Program on page 44.
  - a. Set up at least 3 cycles.
  - b. The soak time should be 2X the cycle time.
  - c. Intelligent Soak Cycling is recommended.

## Upper Threshold (Upper Limit) Moisture Sensor Based Watering

This watering strategy is particularly useful for sites where watering can only be done on specific days where municipal restrictions are enforced or for sites with heavy use such as a sports field.

**Note:** The steps for this configuration are outlined below. A more detailed procedure is available under Advanced Programming in the Resource Library on the Baseline website.

1. Install the soil moisture sensor in the landscaping according to the instructions that came with the device.
2. In the BaseStation 1000, search for and assign the sensor. Refer to Searching For and Assigning Soil Moisture Sensors on page 27.
3. Set up the soil moisture sensor and assign that sensor to the zone that will water it. Refer to Setting Up Moisture Sensors on page 27.
4. Assign the zones in the area that is monitored by the sensor to a program by giving the zones runtimes. Make sure the runtime is sufficient to get through the longest day interval during the hottest time of the year (typically  $\frac{3}{4}$ " water). Refer to Setting Up Zone Runtimes for a Program on page 36.
5. Set up a **Day & Time** start condition for the program. Refer to the topic on setting up day and time start conditions on page 37.
  - a. Start on desired days
  - b. Start at desired time
    - The controller will run every time it is programmed.
6. Set up **Moisture Stop** condition for the program. Refer to Setting a Stop Condition for a Program on page 49.
  - a. Set the **Limit** at field capacity.
  - b. Select **Greater Than Limit**.
  - c. Select **Stop At the End of the Cycle** (not Immediately).
7. Set up the **Soak Cycles** for the program. Refer to Setting Up Soak Cycles for a Program on page 44.
  - a. At least 3 cycles
  - b. DO NOT enable Intelligent Soak Cycles

## Moisture Threshold Maintenance Sensor Based Watering

This watering strategy is useful for high-value landscapes or landscapes where moisture needs to be closely controlled.

The system runs only when needed, but runs as many cycles as necessary to meet the moisture limit.

Moisture stays within 1 – 2% of the limit.

1. Install the soil moisture sensor in the landscaping according to the instructions that came with the device.
2. In the BaseStation 1000, search for and assign the sensor. Refer to Searching For and Assigning Soil Moisture Sensors on page 27.
3. Set up the soil moisture sensor and assign that sensor to the zone that will water it. Refer to Setting Up Moisture Sensors on page 27.
4. Assign the zones in the area that is monitored by the sensor to a program by giving the zones runtimes. Make sure the runtime is set up to put down about 2/10" of water. Refer to Setting Up Zone Runtimes for a Program on page 36.
5. Set a **Moisture Start** condition for the program. Refer to the topic on setting up a moisture start condition on page 39.
  - a. Set the **Limit** between field capacity and maximum allowed depletion so there is no stress to the plant material when a day is skipped.
  - b. Select **Less Than Limit** start.
  - c. DO NOT select **Only on Day & Time**. You want the system to water whenever the moisture falls below limit.
6. **Soak Cycles** are not recommended for this watering strategy.
7. Set up the **Water Window** and block only the hours when you don't want the sprinklers to run. Refer to Setting Up Water Windows for a Program on page 45.

## Start at Lower Threshold/ Stop at Upper Threshold Moisture Sensor Based Watering

This watering strategy is only recommended for watering managers who are closely monitoring the landscape and have time to carefully adjust the watering behavior of the controller.

1. Install the soil moisture sensor in the landscaping according to the instructions that came with the device.
2. In the BaseStation 1000, search for and assign the sensor. Refer to Searching For and Assigning Soil Moisture Sensors on page 27.
3. Set up the soil moisture sensor and assign that sensor to the zone that will water it. Refer to Setting Up Moisture Sensors on page 27.
4. Assign the zones in the area that is monitored by the sensor to a program by giving the zones runtimes. Make sure the runtime is set up to put down about 2/10" of water. Refer to Setting Up Zone Runtimes for a Program on page 36.

5. Set a **Moisture Start** condition for the program. Refer to the topic on setting up a moisture start condition on page 39.
  - a. Set the **Limit** a little above maximum allowed depletion.
  - b. Select **Less Than Limit** start.
  - c. **DO NOT** select **Only on Day & Time**. You want the system to water whenever the moisture falls below limit.
6. Set up the **Water Window** and block only the hours when you don't want the sprinklers to run. Refer to Setting Up Water Windows for a Program on page 45.
7. Set up the **Soak Cycles** for the program. Refer to Setting Up Soak Cycles for a Program on page 44.
  - a. At least 3 cycles
  - b. **DO NOT** enable **Intelligent Soak Cycles**
8. Set a **Moisture Stop** condition for the program. Refer to Setting a Stop Condition for a Program on page 49.
  - a. Set the **Limit** at field capacity.
  - b. Select **Greater Than Limit**.
  - c. Select **Stop At the End of the Cycle** (not Immediately).

## Configuring a Booster Pump

If you have multiple programs that use the same water source, and one or more of those programs require a booster pump, you need to associate the booster pump with the program rather than with the water source.

1. Set up any flow sensors or master valves in **the Water Source Setup**. Refer to Assigning a Flow Sensor to a Water Source on page 55 and Assigning a master Valve/Pump Start biCoder to a Water Source on page 56.
2. Associate the booster pump with the program. Refer to Setting Up a Master Valve/Pump Start for a Program on page 52.



## BL-1000-R Hydrozone Worksheet

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1. Record your programming information from your old irrigation controller. Use the table below to make this process easier.
2. Identify the hydrozones in your landscape. A hydrozone is a grouping of zones that can be watered similarly, such as zones that share the same slope, sun exposure, and plant type. Areas that require dissimilar water or scheduling requirements are considered to be separate hydrozones. Make up a descriptive name for each hydrozone, such as "turf," "shrub border," "perennial bed," and so on. On the worksheet, record the hydrozone for each zone.

### Existing Irrigation Controller Information

Zone#	Program	Run Time	Hydrozone	Zone Description
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				

Zone#	Program	Run Time	Hydrozone	Zone Description
20.				
21.				
22.				
23.				
24.				
25.				
26.				

### Additional Information for Existing Programs

Program	Watering Days	Start Times

### Programming Information for the BaseStation 1000 Controller

Use the table below to plan connections and programming before physically programming the controller.

**Note:** When you are connecting biSensors, wire them across the valve wires that are on terminals A-1, A-2, B-1 or B-2 because only these terminals support biSensors that are wired across valve connections. You can only connect one biSensor per terminal. If you have more than four biSensors, you will need to run two-wire for the additional biSensor connections.

Connector	biCoder S/N	biSensor S/N	Zone # on BaseStation	Old Zone #	Hydrozone	Program	Run Time
A-1	VA00001						
A-2	VA00002						
A-3	VA00003						
A-4	VA00004						

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Connector	biCoder S/N	biSensor S/N	Zone # on BaseStation	Old Zone #	Hydrozone	Program	Run Time
A-5	VA00005						
A-6	VA00006						
A-7	VA00007						
A-8	VA00008						
A-9	VA00009						
A-10	VA000010						
A-11	VA000011						
A-12	VA000012						
B-1	VB00001						
B-2	VB00002						
B-3	VB00003						
B-4	VB00004						
B-5	VB00005						
B-6	VB00006						
B-7	VB00007						
B-8	VB00008						
B-9	VB00009						
B-10	VB000010						
B-11	VB000011						
B-12	VB000012						
E-1	VE00001						
E-2	VE00002						

**Additional Information for New Programs**

Program	Watering Days	Start Times

## Glossary of Terms

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address	When a device is connected to the two-wire, the device is given an address that identifies it to the BaseStation 1000 controller. The controller refers to an address as a “zone number.”
air temperature sensor	A sensor that functions like thermometer to measure the temperature of the air and report this measurement to the controller by way of a biCoder
application rate	The rate at which water is applied to an area within the landscape by an irrigation system. In order to determine proper duration of watering, it is essential that you know the application rate for each watering zone.
auto-calibration	The controller is able to determine the water holding capacity (field capacity) of soil when using biSensor based watering strategies. A single calibration cycle, or automatic monthly calibration cycles can be scheduled.
biCoder™	This is Baseline’s term for several types of two-wire devices. A Baseline valve decoder is referred to as a valve biCoder. Baseline decoders are called biCoders because they are capable of full, bidirectional communications, which enables biCoders to report back to the controller with specific information, including valve solenoid current and voltage, two-wire communications health and voltage, and other rich diagnostics information.
biLine™ protocol	Baseline’s proprietary two-way communication standard that operates over two-wire irrigation wiring
biSensor™	Baseline’s patented digital Time Domain Transmission (TDT) soil moisture sensor
concurrent zones	The number of zones (valves) that can be operated at the same time – typically limited by the amount of water available and the design flow of each of the zones. You can set up the concurrent zones on a per program basis and have it automatically managed using a flow device.
decoder	A two-wire device that can actuate a valve when the controller sends a message to do so
design flow	The GPM that is expected for a zone or the capacity of a mainline, based on the physical components and topology used in construction
distribution	The precipitation rate for different areas of the landscape based on head types, spacing, layout topology, pressure, etc. Having a uniform distribution is very important.
distribution uniformity (DU)	A measure of how evenly a sprinkler system applies water to any specific zone or area. High distribution uniformity means that the measured precipitation rate at any point in a zone will be roughly the same. Low distribution uniformity means that some areas get much more water per minute of runtime than others.

ET-based watering	A watering methodology that uses the principles of evapotranspiration to water when needed rather than on an established schedule
evaporation	Loss of water as vapor from the soil surface or from moisture on the surface of a leaf. Differs from transpiration in that the water does not pass through the plant parts.
evapotranspiration (ET)	The process of transferring moisture from the earth to the atmosphere by evaporation of water and transpiration from plants.
field capacity	This is the maximum water holding capacity of the soil, in other words, the level of soil moisture left in the soil after drainage of the gravitational water. Irrigation to levels above field capacity will result in runoff or drainage as gravitational water.
flow device	A device that is capable of measuring water flow and water used
GPH	The abbreviation for gallons per hour
GPM	The abbreviation for gallons per minute
hydrozone	A grouping of plants that have similar water requirements and can be watered the same
infiltration	The process by which water passes through soil – the liquid permeates the soil by passing through the pores in the soil
Intelligent Soak Cycle™	When a zone waters using an Intelligent Soak Cycle, the total watering runtime includes periods of watering interspersed with periods of soak times, or non-watering times. Baseline's Intelligent Soak Cycles prioritize runtimes for zones that have already started to water over zones that have not started in order to maximize watering efficiency and minimize total irrigation time.
K-value	(also known as K-factor) A calibration factor for a flow device expressed in pulses per unit volume. The K-value is used to calibrate the volumetric throughput of a flow device. Manufacturers give the K-value (or K-factor) of their flow device in the device specification.
lower limit	When you set up a start or stop condition based on soil moisture sensor readings, you can set the lower limit as the trigger for the condition. Then, when the moisture level drops below this limit, the program will start or stop.
master valve (MV)	An automatic or manual valve installed at the supply point which controls water flow into the system mainline piping. The BaseStation 1000 controller supports one master valve and can be upgraded to support up to four. By default, all master valves are assumed to be Normally Closed, unless they are specifically programmed to be Normally Open.

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maximum allowed depletion (MAD)	When the soil moisture content reaches this level, irrigation needs to start. In most cases, the maximum allowed depletion level is just before the plants begin to show visible signs of stress.
microclimate	The climate of a specific location within a landscape. Variations in climate are influenced by subtle differences in temperature, humidity, and wind exposure. Microclimates can have a significant impact on plant water needs.
NCMV	Normally closed master valve – built in to the BL-5402NCMV flow device
NOMV	Normally open master valve – built in to the BL-5402NOMV flow device. It can monitor high flow and shut down independently from the controller.
offset value	A calibration factor for a flow device that compensates for limitations in the device's ability to measure small signals adequately. Manufacturers give the maximum amount of offset associated with their flow device in the device specification
permanent wilting point	When soil moisture content reaches this level, plants can no longer get water from the soil, and they will wilt and die
powered biCoder	A decoder device that interprets the signals that it receives from the controller and tells the valve to turn on or off. A powered biCoder is designed to retrofit into existing systems and requires 120 VAC service at installation location.
program	The controller uses a program to organize watering events. Each program can have different schedules, water days, start/stop/pause conditions, and associated devices. The BaseStation 1000 supports 20 programs and can be upgraded to support up to 40.
pump start	A relay or relay-type device that initiates turn on of a pump, typically a high horsepower electrical or motor driven pump
runoff	When the soil moisture content is at the saturation level, any excess water from rain, snow melt, or irrigation drains to a low point in the landscape
saturation	When the soil moisture content is at this level, nearly all of the spaces between soil particles are filled with water. After a soil has reached saturation, it does not become more saturated; although, in some situations where water is trapped, it can become flooded.
soak cycle	When a zone waters using soak cycles, the total watering runtime includes periods of watering (runtimes) interspersed with periods of non-watering times (soak times).
soil-moisture content	The ratio of the volume of contained water in a soil compared with the entire soil volume

soil-moisture deficit	When soil dries (for example, by evaporation), the measurable shortage of water in the soil is known as the soil-moisture deficit. It also refers to the amount of water needed to return to field-capacity moisture content.
time domain transmission (TDT)	A measurement of how much the electrical signals in the soil are slowed down by the presence of water
timed zone	Any zone programmed to water on a time/day schedule, not a smart irrigation schedule
transpiration	The loss of water vapor from parts of plants. Water is lost primarily from the pores on the leaves but also from stems, flowers, and roots
two-wire	This site wiring technique consists of a cable with an outer insulation, around two internal insulated wires, being used to provide communication and power for all valves and other devices throughout the site. It provides full two-way communication much like a computer network.
upper limit	When you set up a start or stop condition based on soil moisture sensor readings, you can set the upper limit as the trigger for the condition. Then, when the moisture level rises above this limit, the program will start or stop.
valve	A device that opens to allow water to flow to the sprinkler heads or emitters in a zone. It closes to halt watering for that zone.
water window	The time available for watering through an irrigation system. Typically, all days and times would be available for watering unless there are watering restrictions or you need to set aside a time for mowing.
zone	A designated area of landscaping that is watered by a specific valve