



BaseStation 3200 Advanced Irrigation Controller User Manual

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1 – Introduction

Congratulations on choosing the most capable commercial grade smart irrigation controller in the world! You will find that the BaseStation 3200 is capable of dramatically reducing your water use while improving the health and quality of your landscape. Fully central control compatible, the BaseStation 3200 controller will typically pay for itself in one to two seasons based on water waste reduction alone.

The BaseStation 3200 is specifically designed to help you irrigate more efficiently than any other commercial irrigation controller. The 3200 supports multiple smart watering strategies, including smart watering with soil moisture sensors and a historical ET calendar.

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

For first time users, sections 1 through 6 provide an overview of how to get your new BaseStation 3200 controller up and running quickly, while sections 7 through 12 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 3200, we recommend that you review the information in this Introduction before you install and configure your system.

How to Irrigate Efficiently

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 3200 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 watering 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.

If you apply more irrigation water than necessary, the excess water will be wasted – water will pool up on the surface and evaporate before it can soak in, it will run off, or it will gravitationally sink through the soil below the root zone of the plants.

Unlike other irrigation controllers, the 3200 is specifically designed to make efficient irrigation easy. Before you start setting up and programming your BaseStation 3200, it is helpful to understand the following concepts:

- Soil Moisture Content
- How to Use Soil Moisture Sensors, including:
 - Hydrozones
 - Scheduling groups
 - Primary zones and linked zones
- 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

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.

	Saturation	The soil pores are filled with water and nearly all of the air in the soil has been displaced by water. Gravity exerts force on the water contained in saturated soils, moving it deeper into the ground (if possible). When this “gravitational water” moves down through the soil, it becomes unavailable to plants.
	Field Capacity	The level of soil moisture left in the soil after drainage of the gravitational water. If you irrigate to a level above field capacity, it will result in runoff or drainage as gravitational water.
	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 well before the plants begin to show visible signs of stress. Irrigators typically start watering at or before MAD is reached because they do not want their landscapes to show signs of stress.
	Permanent Wilt Point	The minimal point of soil moisture where the plants wilt and begin to die off.
	Oven Dry	When soil is dried in an oven, nearly all water is removed. This moisture content is used to provide a reference for measuring saturation, field capacity, and MAD.

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

The first key for success with soil moisture sensors is to consider 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

After you have identified the hydrozones in your landscaping, determine which irrigation zones are used to water those hydrozones, and then put the irrigation zones into scheduling groups based on their common characteristics. Within the scheduling group, designate the zone where the sensor is located to be the “primary” zone, and then you set up the watering strategy for the scheduling group based on the readings from that sensor. You can link the other zones in the scheduling group to the primary zone so they will be watered more or less relative to it. These zones are called “linked” zones. For more information, refer to Linking Zones (Creating a Scheduling Group) on page 47.

A scheduling group can include any zones that:

- Require irrigation on the same frequency (for example, on the same days)
- Have similar plant types (such as turf, shrubs, or flowers)
- 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 difference in application rates is less than 10x. You can also put drip zones into one group, and subsurface drip zones into another 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 scheduling group that is controlled by a single soil moisture sensor in one of the infields.

Likewise, the manager puts all zones covering the outfields into a second scheduling group controlled 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 group all zones for all the soccer fields together and control 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 scheduling groups representing sunny and shady exposures.

In this way, the irrigation manager is able to configure 42 individual zones into 5 scheduling groups that are controlled by 5 soil moisture sensors.

In the example above, the irrigation manager would configure the 5 scheduling groups for the Upper Limit or Lower Limit watering strategy based on readings from the associated soil moisture sensors. However, each scheduling group can be watered according to any watering strategy appropriate for that section of the landscape.

Choosing the Primary Zone for a Scheduling Group

Because the zones in a scheduling group are naturally similar, any zone in a group can make a good primary zone (the zone where the sensor is located). For large scheduling groups, or scheduling groups with a higher level of variation in sun or wind exposure, choose a primary zone that:

- Requires irrigation the most frequently
- Has an average or greater sun and wind exposure for the scheduling group

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 scheduling 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

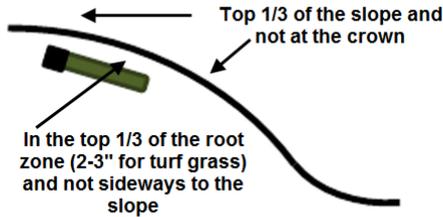
As long as the location of the sensor is average for the zone, you should achieve excellent water efficiency.

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 run time 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

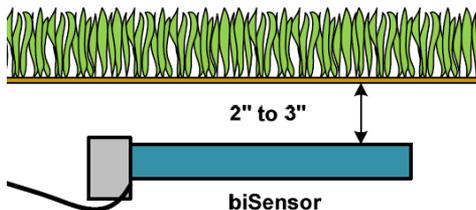
Install the biSensor according to the installation instructions that are included with it. When installing a biSensor in an established landscape, avoid disturbing the surrounding soil in order to reduce the chance that adjustments will be needed later.

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

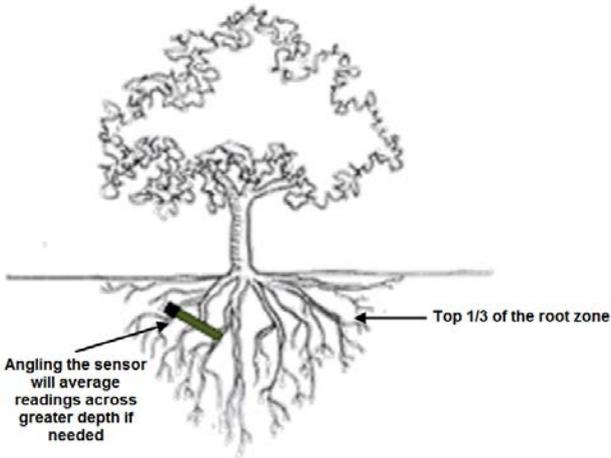
The default watering strategies for the 3200 are intended to optimize water efficiency for established plants and turf. This style of watering can result in poor performance for newly seeded turf.

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 primary 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 run times 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/>

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 3200 provides a variety of watering strategies.

The basic watering strategies supported by the 3200 are shown in the following table.

Timed	Like all irrigation controllers, you can program the 3200 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 a Timed Zone on page 44.
Historical Calendar	The BaseStation 3200 allows you to set the days between irrigation according to a Historical ET calendar. 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 on setting up program start days based on a historical calendar on page 53.

Lower Limit	Also called Lower Threshold. In this soil moisture based, smart watering strategy, irrigation is suspended or skipped until the soil dries to the lower limit, which may be set manually, or set using the automatic calibration process. This watering strategy naturally waters deeply and infrequently and promotes deeper root growth in plants. The controller will water for a specified run time 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 Understanding Lower & Upper Limit Watering Strategies on page 61.
Upper Limit	Also called Upper Threshold. In this soil moisture based, smart watering strategy, irrigation events are scheduled for specific times and dates, but the total run time 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 Understanding Lower & Upper Limit Watering Strategies on page 61.

One important thing to remember about watering strategies – any one zone (or valve) can only be watered according to one strategy. In other words, you cannot configure a zone to be watered automatically using a soil moisture sensor and also be watered on a separate timed schedule.

Zones can be linked together and watered as a group, regardless of the watering strategy selected. Refer to Linking Zones (Creating a Scheduling Group) on page 47 for more information.

Also note that, even with soil moisture based watering strategies, it is important to program the controller so it will put down as much water as required to maintain plant health during the heat of the summer. The 3200 has built-in limits that control how much it is allowed to modify run times or watering days before it assumes that there is an equipment malfunction of some kind.

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 115.

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 nutrition efficient as well.

Understanding Soak Cycling

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 run time 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.

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 watering time 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 3200 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 water time 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.

Using Soak Cycles with Soil Moisture Sensors

Soak Cycling is required on all soil moisture based zones or scheduling groups in order to ensure that the applied irrigation water is reaching the moisture sensor.

If you set a zone or program to start when the soil moisture sensor reading is less than or greater 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.

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 (spray, rotor, multi-stream, etc.) and by the irrigation design.

In reality, it is very common that distribution uniformity is fairly low 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 3200 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. Fixing distribution uniformity issues has better long term results than increasing water times 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 dries 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 water times. Baseline highly recommends that you audit zones in order to determine uniformity and actual application rates.

2 – System Components

This section covers the components, devices, and communication options that are available for the BaseStation 3200 irrigation controller. This section also gives the total supported devices and limits.

Cabinet Options

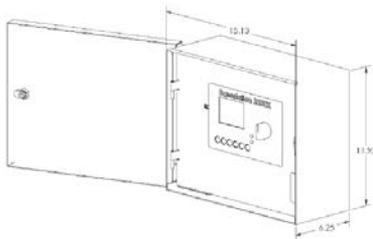
Your BaseStation 3200 will be installed in one of the following cabinets:

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

Note: All cabinet dimensions are in inches.

X/XS-series



P-series



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

Central Control and Remote Communication Options

The BaseStation 3200 is compatible with a number of remote communication options to enable connectivity to Baseline's central control platforms including LiveView and BaseManager.

Remote Communication Options

The BaseStation 3200 controller is compatible with the following remote communication options:

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

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

LiveView™

LiveView makes your controller accessible at anytime from anywhere, with any Internet-accessible device, just as if you were standing in front of it.

To take advantage of LiveView, the controller needs to be connected the Internet with one of the supported communication options. You access the LiveView interface through BaseManager.

Note: LiveView performance is limited with a cellular modem connection.

BaseManager™

BaseManager is a powerful cloud-based central control and remote access platform that allows any BaseStation 3200™ 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 3200 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.

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

For more information, refer to Connecting to BaseManager – Overview on page 94.

BL Commander

The BL-Commander is a handheld radio for activating valves while away from the BaseStation 3200 controller. The radio receiver is powered from the BL-3200X series controller and can be easily moved between controllers for field service and repair. More information is available on the Baseline web site (<http://www.baselinesystems.com>).

- **BL Commander Handheld Remote Control**

You can connect a BL Commander handheld remote control unit to the BaseStation 3200. The BL Commander unit is a special version of the popular TRC Commander remote control unit manufactured by Irrigation Remotes and is compatible with all TRC Commander accessories and antennas.

- **BL Commander Permanent Mount Receiver Kits**

A permanent receiver kit may be factory or field installed. It communicates digitally with the BaseStation 3200 unit via a special internal port in the controller. With this option, you can operate your controllers using a BL Commander handheld unit. The receiver kit has DIP switches to set group and unit security codes.

- **BL Commander Mobile Receiver**

A mobile receiver unit connects to any compatible 3200 controller through the remote control port on the front panel. The mobile receiver unit receives power from the controller.

- **BL Commander Universal Receiver Adapter**

You can use a Universal Receiver Adapter unit to operate older conventionally wired controllers with the BL Commander handheld remote control unit. You can operate up to 32 stations with the Universal Receiver Adapter. To turn zones on and off using the unit, you attach a special connection adapter to each valve wire, common, and to 24 VAC power.

Two-Wire Devices

The BaseStation 3200 can communicate with all of the following Baseline accessories:

- 1, 2, and 4 valve biCoders
- 12, 24, 36, and 48 zone 5200R series powered biCoders
- biSensor soil moisture sensors
- Flow sensor biCoders for connection to third-party flow sensors and master valves
- Shared Flow biCoder – enables the shared flow features on the BaseStation 3200 (used when the controller is in a shared flow group with other controllers and a Baseline FlowStation)
- PFS series smart PVC flow sensors
- BHM series hydrometers – metal-body flow meter and master valve combination
- Pause biCoder – compatible with any standard normally closed pause device such as a rain switch or a wind switch

- Air temperature biCoder
- Pause button (also called a “coach’s button”)
- Pump relay biCoder
- Lightning arrestor/surge suppression devices

You can expand every BaseStation 3200 to support up to 200 zones using virtually any combination of two-wire and conventional wiring.

Total Supported Devices and Limits

The following table lists the total numbers of devices by type that can be connected to a BaseStation 3200. The BaseStation 3200 can communicate with a maximum of 110 devices (device loads) on the two-wire path within the layout and length limits outlined later in this section.

Two-Wire Device Type	Total	Device Loads
Valve biCoders	200	½ per biCoder
5200R series biCoders	20	2 per biCoder
biSensors	25	1
Master Valves/Pump Starts	8	1
Flow Meters	8	3
Event Devices	8	1
Temperature Sensors	8	1

The system supports up to 110 total device loads.

You can configure 200 zones in the 3200 or 3200R controller. Unused ports or serial numbers on biCoders do not occupy a zone address and do not count towards the 200 zone limit.

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)						
	1000-3000	4000	5000	6000	7000	8000		1000	2000	3000	4000	5000	
biCoder and Sensor Load Count	100	15	14	13	8	6	4	100	13	11	8	4	2
	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 3200R and 5200R Series biCoders

Maximum Wire Distance Between Powered biCoder and Valve (ft)

		Valve Wire # (gauge)						
		18	16	14	12	10	8	6
Common Wire #	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 – Wiring Guidelines

Review this section to find instructions for wiring your BaseStation 3200 irrigation controller and for connecting the standard and optional devices.

Conventional Wiring Modules

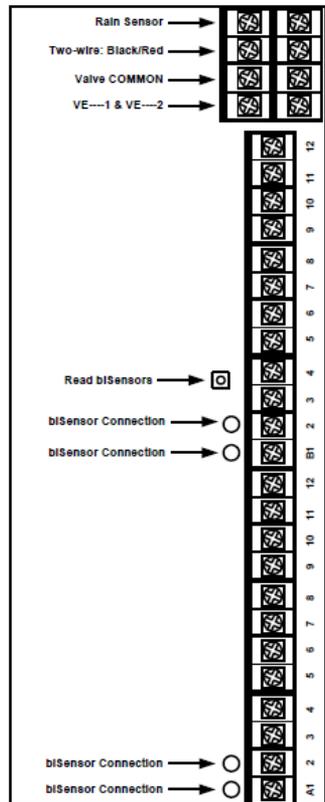
BaseStation 3200R controllers and Baseline 5200R Series Powered biCoders connect directly to conventional 24 VAC irrigation wiring, with one wire for each valve plus a common wire.

Additionally, these devices are capable of communicating to soil moisture sensors over specific terminals that are enabled to search for and communicate with Baseline biSensors.

You can equip each 3200R controller with 12, 24, 36, or 48 zones. An X, XS, or P cabinet accommodates two 12 or 24 zone connection modules.

The terminal designations for each 12 or 24 zone connection module are shown in the diagram on the right, and include:

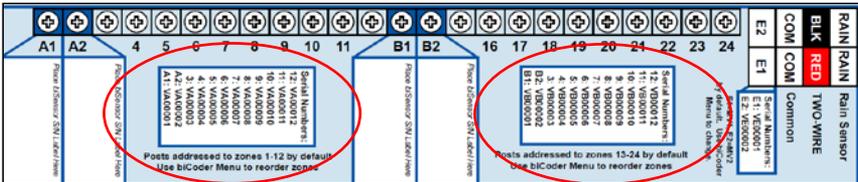
- Rain Sensor Port (Normally Closed)
 - Note:** When you connect a rain click device directly to this port, the device will function globally without any programming. When the contacts on the device open, all watering will be set to Done and no watering will start until the next start time after the contacts have closed.
- Two-wire Port (Red and Black)
- Valve Common (x2)
- Master Valve/Pump Start terminals (2, designated VE1 and VE2) – you can re-address these terminals to control conventional zones if desired
- Sensor-over-valve-wire Ports (x2 for 12 zone, x4 for 24 zone) each with a status LED
- Standard valve wire ports (x10 for 12 zone, x20 for 24 zone)



Only two zones of any 12 zone block of terminals can be activated concurrently, plus VE1 and VE2, resulting in a total concurrency of 6 zones for a 24 zone unit.

You can connect Baseline biSensors directly to valve wires on the Sensor-over-valve-wire ports (A1, A2 and B1, B2).

BaseStation 3200R systems have built-in biCoders, and each screw terminal has a unique serial number. These serial numbers are listed on the wiring label that is included in the unit as shown in the illustration below.



Serial Numbers for zones 1-24 on a BL-5200 Series Powered biCoder™

Powered biCoders are preconfigured at the factory to assign zones 1 to 48 (depending on how many zones the unit is equipped with) to terminals 1 through 48. However, by using the specific serial number, you can reassign any terminal to any zone address. Refer to the topic on changing device assignments on page 41.

Connecting Moisture Sensors over Valve Wires

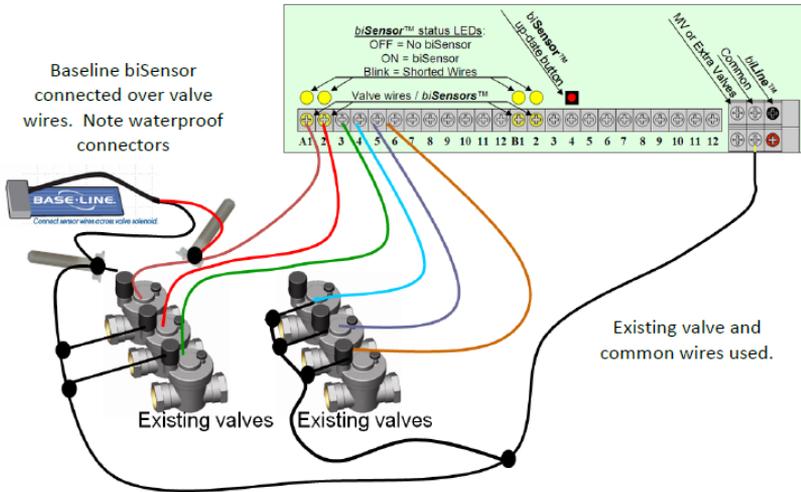
You can connect Baseline biSensors directly to the valve wires on the Sensor-over-valve-wire Ports (A1, A2, B1, B2) on any 12 or 24 zone connection module.

BL-5200 Series Powered biCoder Wiring Example with One biSensor

1. Power off the two-wire when installing devices. Leave 24 to 36 inches of slack on the two-wire to allow for easy installation and maintenance.
2. Wire the sprinkler valves directly to the zone connectors and common connector.
3. Locate the biSensor near the closest valve location.
4. Connect the red wire from the biSensor to the power wire or pilot wire of the valve and black wire from the biSensor to the common wire of the solenoid using the provided 3M™ Direct Bury Splice Kit DBR/Y connector. It is critical that polarity be maintained.

Note: Use wire nuts to test communication, and then replace those wire nuts with 3M™ Direct Bury Splice Kit DBR/Y connectors before burying.

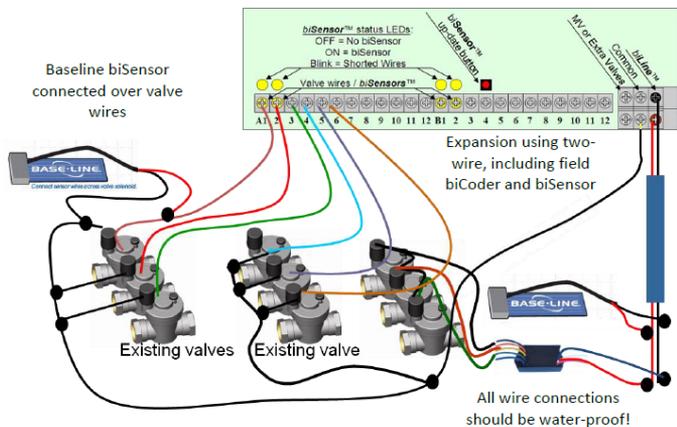
5. Follow the “Burying the biSensor” instructions, included with the biSensor.
6. Connect the pilot wire from the valve to the A1, A2, B1, or B2 terminals.
7. Press the biSensor update button and verify that the light above the terminal stays on.
8. Assign the biSensor and test its operation. Refer to Searching for and Assigning biSensors on page 38 and Testing a Specific Two-wire Device on page 107.



BL-5200 Series Powered biCoder Wiring Example with One biSensor

Expanding with Two-Wire

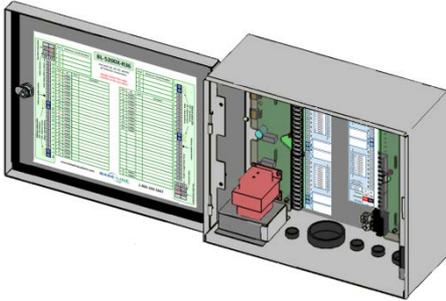
All BaseStation 3200 controllers are capable of communicating with Baseline biCoders and biSensors connected to a two-wire path. Any supported two-wire devices may be connected.



Two-Wire Expansion Example

Connecting to BL-5200R Series Wall Mount biCoders

Baseline 5200R Series Powered biCoders are specifically intended for retrofit applications and make combining several old controllers into a single BaseStation 3200 easy and affordable.



BL-5200X-R48 – 48 Zone Wall Mount biCoder in X-Series Cabinet

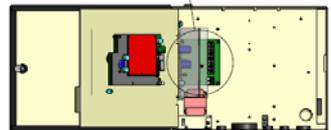
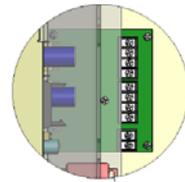
5200R Series Powered biCoders require 110 VAC power (240 VAC for –INT versions) and are installed with the controller in X/XS-series wall mount cabinets, or P-series pedestals.

You can connect up to 20 5200R Series Powered biCoders to a single BaseStation 3200, which enables you to retrofit a large site with multiple controllers into a single BaseStation 3200 controller.

Connecting Devices to the Screw Terminals

When a BaseStation 3200 controller is shipped without a 5200R-Series Powered biCoder, the controller board inside the enclosure has eight screw terminals. Four of these screw terminals are for attaching two-wire, and the other four are labeled Flow, Pause, Rain, and Com(mon). You can replace the factory jumper wires on these terminals with compatible flow sensor, pause switch, and rain switch devices.

A connected device is read each minute, but the device must be read as open two times in a row before action is taken. This means that it could take two minutes for the controller to respond after a device is read.



Location of the screw terminals on a controller in an X cabinet

Devices connected to the screw terminals have the following behaviors:

Flow Sensor Device

- A device connected to this terminal influences non-FlowStation programs, POCs, and booster pumps.
- When the flow sensor contacts open, all watering is shut down:
 - All programs and zones are set to done.
 - All booster pumps are shut off.
 - All POCs are shut down.
 - All learn flow operations are terminated.
- The controller displays a message about the flow shutdown condition. To resume watering, you must clear the message and return the flow sensor contacts to the closed state.

Pause Switch Device

- A pause switch connected to this terminal influences all programs on both the local controller and FlowStation programs.
- When the pause switch contacts open, all water is paused for four hours. The timer starts over at four hours each minute that the switch contacts are open.
- The controller displays a message about the paused condition. Watering will resume where it left off when the switch contacts are closed, and the four-hour timeout is complete.

Rain Switch Device

- A rain switch connected to this terminal influences all programs, both local and FlowStation programs.
- When the rain switch contacts open, all watering is stopped, and all programs and zones are set to done. All programs will be immediately stopped if they are started. No programs can run while the rain switch contacts are open.
- The controller displays a message about the rain switch condition. When the rain switch contacts close, the message is removed automatically so that watering can resume (programs that were stopped are still stopped).

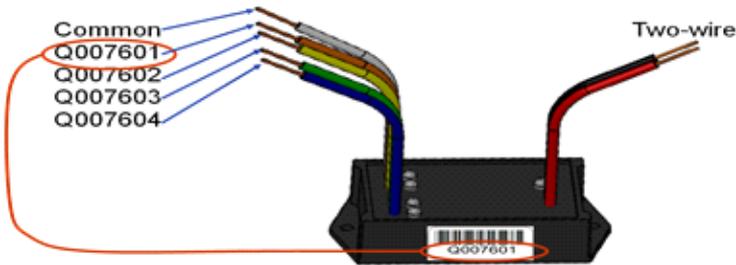
Note: When a 5200R-Series Powered biCoder is directly connected to the controller board, a rain switch connected to the screw terminals behaves as described above. However, when a 5200R-Series Powered biCoder is in its own enclosure or is mounted in an enclosure as a supplemental board, the rain switch terminals are disabled.

Two-Wire Installation

All BaseStation 3200 and 3200R controllers are equipped with a full-function two-wire port capable of connecting to valve biCoders, powered retrofit biCoders, biSensors, flow meters, and other devices. Because Baseline's biLine protocol provides full bidirectional communications, you can connect all your irrigation accessories to the same two-wire path – saving time and money compared to conventional wiring.

Two-Wire Serial Numbers

Each Baseline two-wire device has a unique serial number used to identify it. Serial numbers are labeled on all Baseline devices. For devices such as two or four zone biCoders, each output for the biCoder has a unique serial number, even if it only has one serial number listed on its label.



Serial Numbers for a Four-zone biCoder

Two-Wire Connections and Layout

Baseline uses a proprietary digital protocol to communicate over two-wire. For the complete and up-to-date two-wire specification, please refer to the Resource Library on the Baseline web site. Failure to use approved wire will invalidate the BaseStation 3200 warranty.

Wire Connections

Install all wire connections in compliance with the connector manufacturer's instructions, and make sure that the connections are fully waterproof.

Note: Use a 3M™ Direct Bury Splice Kit DBR/Y connector.

WARNING! Do not connect the two-wire and valve common terminals together because this will damage your BaseStation.

Baseline recommends that you allow 24 to 36 inches of strain relief at each wire connection to make valve box installation and troubleshooting easier and to prevent thermal expansion from pulling connections apart on long wire runs.

Wire Lengths

Total wire length supported depends on the gauge of the wire used.

Straight Run

Wire Size (Gauge)	#18	#16	#14	#12
Wire Length (ft.)	1,900	3,100	5,000	8,000
Total Wire From One Controller = 16,000 ft.				

Looped Run

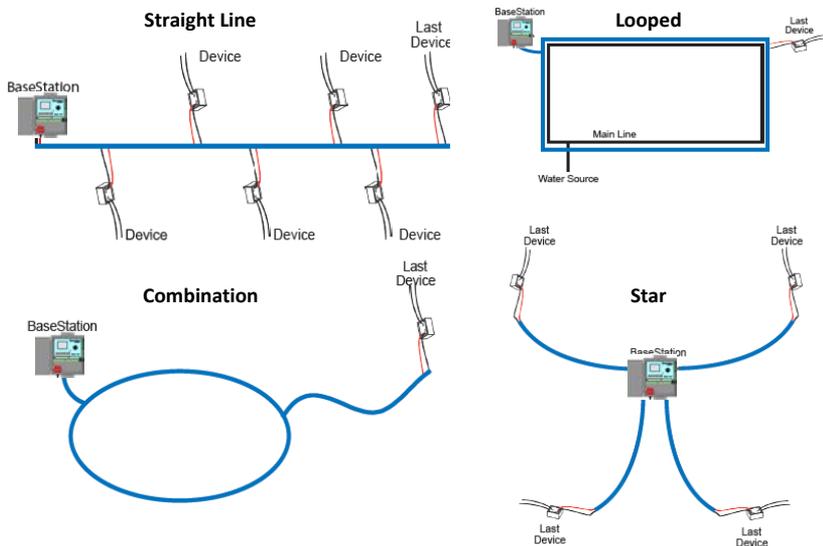
Wire Size (Gauge)	#18	#16	#14	#12
Wire Length (ft.)	3,800	6,200	10,000	16,000

Wire Layout

Straight line, star, looped, and combination configurations are supported.

While the loop topology might provide a more robust configuration, it is harder to trace the wiring errors that might occur. For this reason, Baseline recommends the other topologies over the loop.

The straight line and the star topology are the recommended layouts. To simplify the illustrations, only the last device is shown for most configurations. You can assume that other devices, both sensors and biCoders, are connected along the length of the two-wire path. On a star configuration, the topology has multiple last devices. Each device must separately meet the distance requirement.



Wire Burial

Bury all wire at an appropriate depth to protect it from mechanical damage due to digging or aeration.

Baseline's two-wire system operates under 30 VAC RMS, which is considered safe for shallow burial as outlined in the National Electric Code. All installations should comply with local electrical codes.

Removing a Two-Wire Device

If you want to remove a two-wire device, first you must physically disconnect it from the two-wire, and then you perform a Search operation from the device specific menu in the controller.

Example: If you need to remove a biSensor, physically disconnect the biSensor from the two-wire. Then go to the controller and turn the dial to Assign. Perform the steps to search for the biSensor (refer to Searching For and Assigning biSensors on page 38). When the controller detects that the biSensor is no longer connected, it will remove the device from the configuration.

Note: Refer to the Configuring Devices section on page 32 of this manual for the configuration procedures for the various two-wire devices.

4 – The BaseStation 3200 Interface

Review this section to get familiar with the layout of the BaseStation 3200 interface. This information covers the components of the front panel, the Online Help, the features of the main screen, as well as the status colors and a brief overview of the on-screen reports.

Controller Front Panel Layout



(1) USB Port – The USB port is used for doing Backup and Restore operations using a USB drive (also known as a “thumb drive” or a “flash drive”). The USB port is also used for doing firmware updates and exporting operation log files.

(2) Display – The color display indicates the current state of the controller and is used to display programming. This display uses thin-film transistor (TFT) technology to improve image quality in outdoor conditions including direct sunlight and low light.

(3) Dial – The dial is used to select the operation or programming mode of the controller.

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

+ Increases the value of the highlighted field or sequences through the available options in the selected field

– Decreases the value of the selected field, or sequences through the available options in the selected field

Next Moves the highlighted selection to the next field on the display

Previous Moves the highlighted selection to the previously selected field on the display

Back Moves back to the previous menu and can sometimes be used to stop an operation

Enter Applies the current selection and moves to the next item, or begins the operation

(5) Status LEDs – These two LEDs indicate the power status of the controller and the internal status of the controller hardware. The upper light is normally ON, but it may blink when internal diagnostics are run.

(6) Remote Control Port – This connector is used with the BL Commander hand-held radio remote control to operate valves while away from the controller.

RUN Main Screen

When the controller dial is in the **RUN** position, the main screen is the Zone Status. Press the **Next** or **Previous** button to cycle through the other available screens including the All Zones & Programs Status and the Detailed Status By Program. You can leave one of these alternate screens visible and it will continue to display when the controller dial is in the **RUN** position until the controller is reset. At that point, the Zone Status screen redisplay.

Zone Status Screen

The Zone Status screen is the default main screen when the controller dial is in the **RUN** position. Zones 1 – 50 are shown and the colors in the grid represent the status of each zone. For an explanation of the colors, refer to the Status Colors topic on page 29.

Press the + button to display the next group of 50 zones. Press the – button to go back through the groups.

Controller serial number is normally black, but changes to blue during a learn flow operation

Pump/MV Status: C

1 - 10									
11 - 20									
21 - 30									
31 - 40									
41 - 50									

Pump/MV Status
 Green = idle
 Blue = active
 Gray = disabled
 White = not used

 C = normally closed
 O = normally open

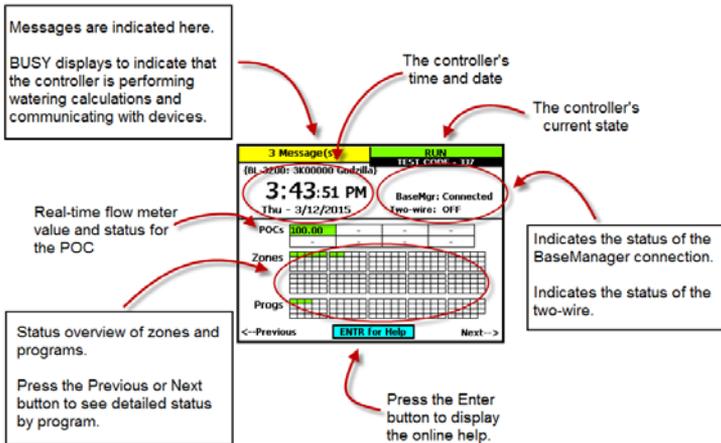
The flow rate cycles between all configured flow meters/sensors

The number is black when the flow is stable, but changes to blue when the flow is unstable

Note: Refer to the All Zones & Programs Status Screen illustration on the following page for more details.

All Zones & Programs Status Screen

When the controller dial is in the **RUN** position and the main Zone Status screen is displayed, press the **Next** button to go to the All Zones & Programs Status screen.



If you leave the All Zones & Programs Status screen displayed, it will continue to display when the controller dial is in the **RUN** position until the controller is reset. At that point, the Zone Status screen redispays.

When the All Zones & Programs Status screen is displayed, press the **Previous** button to return to the Zone Status screen, or press the **Next** button to go to the Detailed Status By Program screen.

Detailed Status by Program Screen

When the controller dial is in the **RUN** position and the main Zone Status screen is displayed, press the **Next** button twice to display the Detailed Status By Program screen.

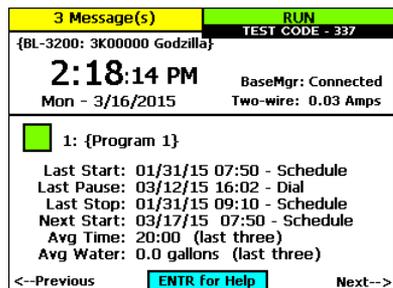
Press the + or – button to cycle through the controller’s programs.

The colored box on the left indicates the program status. Refer to the Status Colors topic on page 29 for an explanation of the colors.

The following information is available in the fields:

Last Start: The date and time when the program was started for any condition including manual starts. The field also indicates what caused the last start.

Last Pause: The date and time of the most recent pause. The pause information shows until the program is started again. The field also indicates what caused the last pause.



Last Stop: The date and time when the program last completed watering. When a program is watering, this field is blank. The field also indicates what caused the last stop.

Next Start: The estimated next start date and time for the program. In some cases, the start condition for a program makes it difficult to accurately estimate when the next start will occur. Consider the information in this field as helpful, but remember that it might not be perfectly accurate depending on the program settings.

Avg Time: An average of the last three run times.

Avg Water: An average of the amount of water used during the last three run times.

If you leave the Detailed Status By Program screen displayed, it will continue to display when the controller dial is in the **RUN** position until the controller is reset. At that point, the Zone Status screen redisplay.

When the Detailed Status By Program screen is displayed, press the **Previous** button to return to the All Zones & Programs Status screen, or press the **Next** button to go to the Zone Status screen.

Status Colors

The following colors display on the RUN screen to indicate the status of programs, master valves, flow meters, and zones.

	Idle (watering done)		Disabled
	Active (watering)		Paused
	Waiting to water		Off or Message (blinking)
	Soaking		Unused

On-Screen Reports

The on-screen reports include the results of Test All, the soil moisture graph, the run time graph, and the water used graph.

Note: Refer to Notes, Messages, and Logs on page 102 for the complete description of the on-screen reports.

1. Turn the dial to the **Reports** position.
2. In the **Select Report** field, press the + or – button to display the various reports.

Online Help

At the bottom of every screen, there is a Help option that displays the Online Help. The Online Help describes how to use the buttons to change the functions associated with that screen.

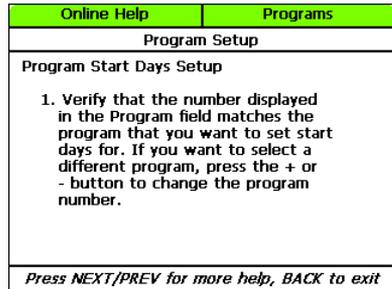
To display the help, press the **Next** or **Previous** button to highlight the **Help** option at the bottom of a screen, and then press the **Enter** button.

Press the **Next** button to move through the pages of the Online Help.

Press the **Previous** button to back up.

Press the **Back** button to return to the controller screen.

The help can be displayed in Spanish. Refer to Selecting the Language for Online Help on page 86.



Power Cycling or Restarting the Controller

If the controller goes into an abnormal state and does not respond, you might need to restart it.

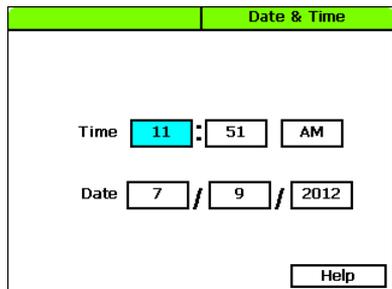
1. Turn the dial to **OFF**.
2. Press and hold the **-** and **+** and **Enter** buttons for approximately 5 seconds.
3. After the screen goes blank, release the buttons.
4. Turn the dial to **RUN**. The controller restarts.

Setting the Controller Time and Date

Set or change the controller date and time to match the current time and date. An inaccurate date and time can cause watering events to be missed.

Note: When the controller is connected to BaseManager, the date and time are automatically set.

1. Turn the dial to the **Time & Date** position.
2. In the **Time** field, the hours place is highlighted.
3. Press the **+** or **-** button to change the value.
4. Press the **Next** button to move to the minutes place, and then press the **+** or **-** button to change the value.



5. Press **Next** to continue moving through the fields, and then press the + or – button to change the value.

Note: If you made a change to the time or date and you want to revert to the previous entries, press the Back button.

6. When you have finished making changes, turn the dial to the **RUN** position.

Checking the Firmware Version on Your Controller

Turn the dial to the **Advanced** position.

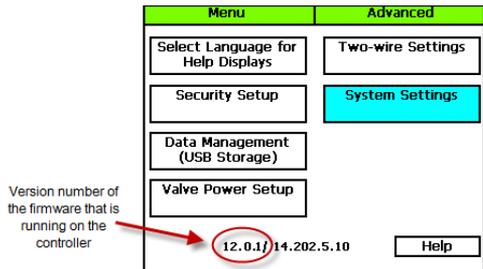
The version number of the firmware displays at the bottom of the screen.

Firmware updates are free for the life of any Baseline controller as long as the hardware is compatible. Baseline will periodically release firmware updates 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). Click the **Support** tab and then click the **Firmware Version Updates** link in the menu on the left. Click the tab for your product. 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 Controller Firmware on page 92.



5 – Configuring Devices

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 3200 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 assign a valve biCoder's serial number to the number or address of the zone that the valve waters.

The BaseStation 3200 controller accommodates up to 200 zones, and those zones are identified in the controller with numbers 1 to 200. These numbers are also referred to as “addresses” because they tell the controller where a specific device “lives.”

Searching For and Configuring Zone biCoders

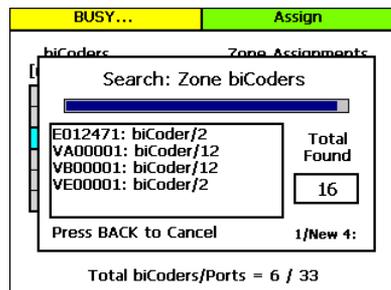
Before you can configure any devices such as biCoders or biSensors in the controller, the controller must find those devices and assign them. You can connect the following types of biCoders and other two-wire devices directly to the two-wire path:

- Valve biCoders (decoders)
- biSensors (soil moisture sensors)
- Event biCoders and air temperature sensors
- Pump start devices and master valves
- Flow devices

Searching For biCoders (including Powered biCoders)

1. Turn the dial to the **Assign** position.
2. Press the + or – button to select **Search** in the Assign screen.
3. Press the **Enter** button to search for biCoders. The search may take several minutes to complete. You will see a status screen like the one shown here while the search is in progress.

The display shows the number of devices found and the number of ports or addresses available.



Note: To cancel a search in progress, press the Back button.

4. Continue to the procedure for assigning the biCoders to zones on page 33.

Assigning Valve biCoders to Zone Numbers

You can assign **any** valve biCoder serial number to **any** zone number.

You may also wish to reassign and/or reorder certain zones in order to properly combine primary and linked zones in a scheduling group.

The 3200 makes these assignments quick and easy to do, but be sure to document any changes that you make. Failure to properly document assignments can cause confusion and frustration for maintenance staff.

Zone Numbers are Pre-Assigned in R-Series

When you order a conventionally wired BaseStation 3200R controller, it is pre-programmed at the factory so that that terminal 1 is assigned to zone 1, terminal 2 is assigned to zone 2, and so on. You can change these zone numbers to organize scheduling groups, primary, and linked zones to achieve optimal watering behavior.

Note: Baseline recommends that you use the Hydrozone Worksheet on page 117 to plan the conversion from your existing irrigation controller to your new BaseStation 3200.

To change or re-order zone numbers in an R-series unit, perform the steps in the topic on clearing a previous zone number assignment on page 41, and then assign each biCoder serial number to the desired zone number. Refer to the topic on assigning biCoders to zones on page 33.

Note: The serial numbers for all terminals in 3200R controllers are shown on the label next to the terminals. The serial numbers for terminals in 5200R biCoders are shown on the door label.

To assign biCoders to zones

1. If you have not searched for the biCoders, do that first. Refer to Searching For biCoders (including Powered biCoders) on page 32.
2. With the dial in the **Assign** position and the biCoders list displayed, press the + or – button to select any unassigned decoder serial number.
3. Press the **Next** or **Previous** button to move to the **Zone Assignments** column and select an available zone number.
4. Press the **Enter** button to assign the selected biCoder to that zone number.
5. When you have finished making changes, turn the dial to the **RUN** position.

		Assign	
biCoders [minus][plus]		Zone Assignments [previous][next]	
-		199	-
Help		200	-
Search	Press ENTER To Search for Decoders	1	-
Unassign		2	-
D003329		3	-
E012471		4	-
Total biCoders/Ports = 6 / 33			

Note: If you need to change your biCoder assignments, refer to Changing Device Assignments on page 41.

Configuring Zone Settings

After you have searched for your biCoders and assigned them to zones, you can configure the various settings for each zone. The controller supports 200 standard zones.

1. Turn the dial to the **Zones** position. The Zones screen displays for the first zone.
2. In the **Zone** field press the + or – button to change the number to the zone that you want to modify.
3. Press the **Next** button to move to the **Zone Mode** field. Press the + or – button to change the value in the field to one of the following settings:

Zones	
{Program 1}	Zone [Q006642] 1
1	{Zone 1}
Program	Zone Mode Primary
	Water Time (h:mm) 0:30
	Cycle Time (h:mm) 0:10
	Soak Time (h:mm) 0:20
	Flow 0.00
	Enabled YES
Programs: 1	Help

Note: If you change the mode of a zone to

Primary or from Primary to another mode, you will potentially affect the programming of other zones. For example, a primary zone has 20 linked zones. If you change the mode of the primary zone to linked or timed, the links to the 20 zones will be broken.

- **Primary** – The zone within a scheduling group that all other zones are linked to. Changing the programming on this zone will adjust the programming on all linked zones, resulting in saved time and consistency. If you are using a biSensor, the primary zone is the zone where the sensor is located.
- **Linked** – Within a zone group, there is one primary zone and all other zones are then “linked” to the primary and will get their programming information from the primary (water time, program, schedule, etc.)
- **Timed** – Any zone programmed to water on a time/day schedule, rather than on a smart irrigation schedule

4. Press the **Next** button to move to the **Water Time** field.

- If you want to increase the value in the hours place, press the + button.
- If you want to change the value in the minutes place, press the **Next** button, and then press the + or – button.

Note: When you change the water time setting for a linked zone, notice that a percentage displays to the left of the Water Time field. This percentage compares the new value with the value in the Water Time field for the Primary zone and establishes a tracking ratio. The ratio will be maintained when changes are made to the primary zone’s water time.

Tip: Let the controller calculate the cycle time and soak time settings for you. Press the Next button to move to the minutes placeholder in the Soak Time field, and then press the Back button. The controller divides the time in the Water Time field by 3. This value is used for the cycle time and the default soak time is 30 minutes.

5. Press the **Next** button to move to the **Cycle Time** field. If you are using soak cycles for this zone, the cycle time defines the duration of each watering cycle interspersed with soak times.

Note: You cannot change the cycle time setting for a linked zone.

6. Press the **Next** button to move to the **Soak Time** field. If you are using soak cycles for this zone, the soak time defines the duration of each soaking cycle interspersed with watering times.

Note: You cannot change the soak time setting for a linked zone.

7. Press the **Next** button to move to the **Flow** field. If you know the gallons per minute flow for this zone, you can press the + or – button to enter it in this field. You can also perform a Learn Flow operation to update this field. Refer to Learning Flow by Zone on page 77.
8. Press the **Next** button to move to the **Enabled** field. Press the + or – button to toggle the value in the field between **YES** and **NO**.

Note: If you want to prevent a zone from running, you can temporarily set the Enabled field to NO. When you want the zone to run again, return to the Zones dial position and change this setting to YES. This setting disables the zone in all programs.

9. The number in the **Program** field in the upper-left corner of the screen indicates what program these zone settings are for. A zone can be removed from a program, assigned to a different program, or assigned to more than one program. If you want to make a change to how the zone is assigned to a program, perform one of the following actions; otherwise, skip to step 10 of this procedure.

Note: To move to the Program field, press the Next or Previous button.

- To remove the zone from the current program, press the **Previous** button to return to the **Water Time** field, and then press the – button to remove the watering time in the field.
- To assign the zone to a different program, perform the previous task to remove the zone from the current program. Move to the **Program** field, and press the + or – button to change the number to the new program that you want the zone to be assigned to.
- To assign the zone to an additional program, move to the **Program** field, and press the + or – button to change the number to the additional program that you want the zone to be assigned to. Repeat steps 3 – 7 to configure the zone settings in the new program.

Note: The lower-left corner of the screen shows what programs the zone is assigned to.

10. After you have configured the settings for the current zone, perform one of the following actions:
 - To configure another zone, press the **Enter** button until the number of the zone that you want to configure displays in the **Zone** field at the top of the screen. Repeat steps 3 – 9.
 - When you have finished making changes, turn the dial to the **RUN** position.

Adjusting the Valve Power Level for a biCoder

If your irrigation system uses solenoids that have different power requirements, you can adjust the valve power level of the biCoders that are attached to the zones associated with these solenoids. Typically, you will perform this task under the guidance of Baseline Support.

Note: You only need to perform this procedure when the current read by the biCoder is less than .110 Amps.

1. Turn the dial to the **Advanced** position.
2. Press the **Next** or **Previous** button to move to the **Valve Power Setup** option, and then press the **Enter** button.
3. Press the + or – button to select the zone and biCoder that you want to adjust.
4. Press the **Next** button to move to the **Valve Drive Power** field, and then press the + or – button to change the value.

You can adjust the valve power for any biCoder from a minimum of 1 to a maximum of 3. If a biCoder does not support this feature, the word “Fixed” displays in the Valve Drive Power field.

5. When you have finished making changes, turn the dial to the **RUN** position.

Searching For Start, Stop, & Pause Devices

Programs can be started, stopped, or paused by the following conditions monitored by a dedicated device:

- Whether the contacts on event biCoders are open or closed
- Whether moisture levels are above or below a specified percentage as monitored by a biSensor
- Whether temperature values are above or below a specified level as monitored by either moisture sensors or temperature sensors

Searching For and Assigning Event biCoders

The BaseStation 3200 supports 8 event biCoders.

1. Turn the dial to the **Start, Stop, Pause** position.
2. Press the **Next** or **Previous** button to highlight the **Event biCoders Setup** option.
3. Press the **Enter** button. The Event biCoders screen displays.
4. **All** is highlighted in the Program column. Perform one of the following:
 - To associate the event biCoder with the full controller, continue to step 5.
 - To associate the event biCoder with a specific program, press the + button to move to that program number. Continue to step 5.
5. Press the **Next** button to highlight **Search**.
6. Press the **Enter** button to search for event biCoders. The serial numbers of the biCoders are shown in the Event biCoders column.

Event biCoders		Start, Stop, Pause	
Pgm	Event biCoders	Contacts = Closed	Value
99	-	Start	<input type="checkbox"/> Off
All	Search	Stop	<input type="checkbox"/> Off
1	P000116	Pause	<input type="checkbox"/> Off
2	-	Pause Time	<input type="text"/>
3	-		
4	-		
{Program 1}			
{Event biCoder P000116}			
			<input type="button" value="Help"/>

7. Press the + or – button to highlight the serial number of the event biCoder that you want to assign.
8. Continue to the procedure for setting up the start, stop, and pause conditions for event biCoders on page 64.

Searching For and Assigning Soil Moisture Sensors (for Start, Stop, Pause Conditions)

The BaseStation 3200 supports 25 soil moisture sensors. Any soil moisture sensors used to monitor start, stop, and pause conditions are included in the total count.

1. Turn the dial to the **Start, Stop, Pause** position.
2. Press the **Next** or **Previous** button to highlight the **Moisture Control Setup** option.
3. Press the **Enter** button. The Moisture biSensors screen displays.
4. **All** is highlighted in the Program column. Perform one of the following:

- To associate the moisture sensor with the full controller, continue to step 5.
- To associate the moisture sensor with a specific program, press the + button to move to the program number. Continue to step 5.

Moisture biSensors		Start, Stop, Pause	
Pgm	Moisture biSensors	Enable	Value
98	-	Start	<input type="text"/>
99	-	Stop	<input type="text"/>
All	Search	Pause	<input type="text"/>
1	SB01130		<input type="text"/>
2	-		
3	-		
{BL-3200: 3K00000}			
			<input type="button" value="Help"/>

5. Press the **Next** button to highlight **Search**.
6. Press the **Enter** button to search for moisture sensors. The serial numbers of the sensors are shown in the Moisture Sensors column.
7. Press the + or – button to highlight the serial number of the moisture sensor that you want to assign.
8. Continue to the procedure for setting up the start, stop, and pause conditions for moisture sensors on page 65.

Searching For and Assigning Air Temperature Sensors

The BaseStation 3200 supports 8 air temperature sensors.

1. Turn the dial to the **Start, Stop, Pause** position.
2. Press the **Next** or **Previous** button to highlight the **Temperature Control Setup** option.
3. Press the **Enter** button. The Temperature biSensors screen displays.
4. **All** is highlighted in the Program column. Perform one of the following:

Temperature biSensors		Start, Stop, Pause	
Pgm	Temperature biSensors	Enable	Value
98	-	Start	<input type="text"/>
99	-	Stop	<input type="text"/>
All	Search	Pause	<input type="text"/>
1	SB01130		<input type="text"/>
2	-		
3	-		

{BL-3200: 3K00000}

- To associate the temperature sensor with the full controller, continue to step 5.
- To associate the temperature sensor with a specific program, press the + button to move to the program number. Continue to step 5.

5. Press the **Next** button to highlight **Search**.
6. Press the **Enter** button to search for temperature sensors. The serial numbers of the sensors are shown in the Temperature biSensors column.
7. Press the + or – button to highlight the serial number of the temperature sensor that you want to assign.
8. Continue to the procedure for setting up the start, stop, and pause conditions for air temperature sensors on page 66.

Searching For and Assigning Other Devices

Searching For and Assigning biSensors

If you want to use soil moisture sensors (biSensors) to monitor your zones, you need to assign a biSensor to a primary zone. If you have not configured any primary zones, you will not be able to complete the following procedure. Refer to Setting Up a Primary Zone on page 46.

Keep in mind that a zone can be a primary zone in more than one program. When you are assigning a biSensor, make sure to select the correct zone and program.

Note: The BaseStation 3200 supports 25 biSensors.

1. Turn the dial to the **Smart Watering** position.
2. The **Moisture biSensor Assignments** option should be highlighted. If it is not highlighted, press the + or – button to highlight it.

3. Press the **Enter** button. The Assign biSensor screen displays.
4. The **Search** option should be highlighted in the column on the left. If it is not highlighted, press the + or – button to highlight **Search**.
5. Press the **Enter** button. The system lists the serial numbers of all biSensors that it finds.

Note: The BaseStation 3200 supports 25 biSensors.

Assign biSensor		Smart Watering		
biSensors [minus plus]		Assign Zone/Prg to biSensor		
Search		Zone	Prg	biSensor
Unassign		-	-	-
SB01130	Enter to -----> Assign	1	1	-
-		-	-	-
-		-	-	-
-		-	-	-
biSensor: {Moisture biSensor SB01130}		Zone: {Zone 1}		

6. Press the + or – button to highlight the serial number of the biSensor that you want to assign, and then press the **Enter** button. The serial number moves from the list on the left to zone address/program list on the right.
7. When you have finished making changes, turn the dial to the **RUN** position.

Note: If you need to change your biSensor assignments, refer to Changing Device Assignments on page 41.

Searching For and Assigning Pump Start Devices and Master Valves

The BaseStation 3200 supports up to 8 normally open and/or normally closed master valves and/or pump starts for the entire system. Valve biCoders are assigned to Pump/MV numbers, and flow+NOMV are assigned to MVs.

The following Pump/MV types are supported:

- Normally Closed – uses a traditional valve biCoder and is assigned to a POC
- Normally Open – uses a traditional valve biCoder, or is part of a Flow+NOMV biCoder and is assigned to a POC
- Main pump – uses a traditional valve biCoder (or a pump relay biCoder) and is assigned to a POC
- Booster pump – uses a traditional valve biCoder (or a pump relay decoder) and is assigned to the list of programs

1. Turn the dial to the **Water Sources** position.
2. The **Assign Decoders to Pumps/MVs** option should be highlighted in the box on the left. If it is not highlighted, press the **Next** button to highlight the option.
3. Press the **Enter** button. The Assign Pump/MV screen displays.
4. The **Search** option should be highlighted in the box on the left. If it is not highlighted, press the + or – button to highlight **Search**.

Assign Pump/MV		Water Sources	
biCoders [minus plus]		Pump/MVs [previous next]	
Search		MV7	-
Unassign		MV8	-
D003329	Press ENTR -----> to Assign	MV1	-
VE00001		MV2	-
VE00002		MV3	-
-		MV4	-
biCoder 1 of 3			

5. Press the **Enter** button. The system lists the serial numbers of all pump/MV devices that it finds.
6. Press the **+ or –** button to highlight the serial number of the pump/MV device that you want to assign, and then press the **Enter** button. The serial number moves from the list on the left to an MV address row on the right.
7. When you have finished making changes, turn the dial to the **RUN** position.

Note: If you need to change your Pump/MV assignments, refer to Changing Device Assignments on page 41.

Searching For and Assigning Flow Meters

The BaseStation 3200 supports up to 8 flow sensors or meters, which manage and monitor flow across a site as independent or connected hydraulic systems organized into mainline groupings.

In addition to finding flow biCoders, this search finds two-wire flow meters with integrated master valves (both normally open and normally closed).

1. Turn the dial to the **Water Sources** position.
2. Press the **Next** or **Previous** button to select **Flow biCoders Setup**, and then press the **Enter** button. The Flow biCoders screen displays.
3. Press the **+ or –** button to select **Search** in the Flow biCoders column.
4. Press the **Enter** button to search for flow biCoders. The system lists the serial numbers of all flow biCoders that it finds.
5. Press the **+ or –** button to select the flow biCoder that you want to enable.
6. Press the **Next** button to move to the **Enable** field. Press the **+ or –** button to toggle the value in the field between **YES** and **NO**.
7. Press the **Next** button to move to the **K-Value** field.

Flow biCoders	Water Sources
Flow biCoders	Enable <input type="text" value="YES"/>
-	na
Search	K-Value <input type="text" value="1.70"/>
00W0268	Offset <input type="text" value="-0.316"/>
-	or
-	Pulses/GAL <input type="text" value="35.3"/>
-	
{Flow biCoder 00W0268}	
00W0268: POC 1	
	<input type="button" value="Help"/>

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.
8. Press the **Next** button to move to the **Offset** field.

Note: The offset is 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.

- If the device is a Baseline flow biCoder, the correct offset automatically displays in the field. Press the + or – button to change the offset if necessary.
 - If the device is not a Baseline flow biCoder, you need to enter the offset manually. Find the offset for the device in the manufacturer’s documentation, and then press the + or – button to enter the number in the Offset field.
 - If the device does not have an offset value, you can enter the pulses per gallon in the **Pulses/GAL** field to provide the same compensation factor as the offset.
9. When you have finished making changes, turn the dial to the **RUN** position.

Changing Device Assignments

As you maintain your irrigation system over time, you may need to change how your devices are assigned. Perhaps you replace a device with a new one or you move a device to another part of your irrigation system.

You might also want to reassign your biCoders to different zone numbers in order to accurately represent the layout of your irrigation system.

The BaseStation 3200 has the following options for changing device assignments:

- Unassigning a device – This method removes all the programming that is associated with the device.
- Replacing an assigned device with a new device – This method retains the programming and associates it with the new device.

Unassigning a Device

WARNING! Unassigning a device removes all the programming associated with the device. To save the programming, refer to Replacing an Assigned Device with a New Device on page 42.

1. Depending on the type of device you want to unassign, turn the controller dial to one of the following positions:
 - To unassign a biCoder, turn the dial to **Assign**.
 - To unassign a biSensor soil moisture sensor, turn the dial to **Smart Watering**, and then select **Moisture biSensor Assignments**.
 - To unassign a pump or a master valve, turn the dial to **Water Sources**, and then select the **Assign biCoder to Pump/MVs** option.

2. Press the + or – button until **Unassign** is highlighted in the left column.
3. Press the **Next** button to move to the device assignments column on the right.
4. Press the **Next** or **Previous** button to select the device that you want to unassign.
5. Press the **Enter** button. A message displays warning that programming will be removed.
6. To unassign the device, press the **Enter** button again. If you want to cancel, press any other button.

		Assign	
biCoders [minus plus]		Zone Assignments [previous next]	
Help		2	E012472
Search		3	Q006641
Unassign	Press ENTR <----- To Unassign	4	Q006642
D003329		5	Q006643
Q006644		6	-
VA00001		7	-
		Status = OK, 0.24 Amps	
Total biCoders/Ports = 6 / 33			

Note: If you cleared a zone number assignment so you can reassign certain zones in order to properly combine primary and linked zones in a scheduling group, return to the topic on assigning biCoders to zones (on page 33) to complete the assignments.

7. When you have finished making changes, turn the dial to the **RUN** position.

Replacing an Assigned Device with a New Device

If you need to replace a device in the field, you can replace the device in the controller with the new device. Replacing a device copies all the programming associated with the original device to the new device.

This option is especially useful if you need to replace the biCoder on a Primary Zone. By replacing the assigned device with a new device, all your primary zone configuration and linked zone settings will be copied to the new device.

1. Depending on the type of device you want to replace, turn the controller dial to one of the following positions:
 - To replace a biCoder, turn the dial to **Assign**.
 - To replace a biSensor soil moisture sensor, turn the dial to **Smart Watering**, and then select **Moisture biSensor Assignments**.
 - To replace a pump or a master valve, turn the dial to **Water Sources**, and then select **Assign biCoder to Pump/MVs**.
2. Press the + or – button to highlight **Search** in the left column, and then press **Enter**.

3. Press the + or – button to select the serial number of the new device that you want to put in place of an assigned device.
4. Press the **Next** or **Previous** button to move to the **Zone Assignments** column and select the zone number and serial number of the device that you want to replace.
5. Press the **Enter** button to replace the selected device with the new device.
6. When you have finished making changes, turn the dial to the **RUN** position.

		Assign	
biCoders [minus plus]		Zone Assignments [previous next]	
Unassign		199	-
D003329		200	-
E012472	Press ENTR -----> To Assign	1	E012471
Q006642		2	Q006641
Q006644		3	Q006643
VA00001		4	-
biCoder 2 of 30		Status = OK, 0.24 Amps	
Total biCoders/Ports = 6 / 33			

6 – Initial Programming

After you have assigned your devices as described in the previous section, you are ready to start the initial programming on your BaseStation 3200 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.

Setting Up Time-Based Watering

The BaseStation 3200 provides the following methods for controlling the amount of water that is applied to a zone:

- Watering based on time and schedule
- Watering based on soil moisture
- Watering based on a historical calendar

Even if you are planning to use soil moisture method or the historical calendar to control how much water to apply, you still need to set up the time-based watering schedule for your zones.

Setting Up a Timed Zone

By default, all zones are set up as timed. If the mode of a zone was changed to linked or primary, you can use this procedure to change the zone mode back to timed.

Implications for changing a zone within a scheduling group to timed:

- If you change a zone in the middle of your scheduling group from linked to timed, the linked zones will continue to water as a group, but the zone that was changed to timed will now water on a timed schedule.
- If you change a primary zone to timed, all zones that are linked to that primary zone will be changed to timed.

To set up a timed zone

1. Turn the dial to the **Zones** position. The Zones screen displays for the first zone.

Zones	
{Program 1}	Zone [Q006642] {Zone 1}
<input type="text" value="1"/>	<input type="text" value="1"/>
Program	Zone Mode <input type="text" value="Primary"/>
Water Time (h:mm)	<input type="text" value="0:30"/>
Cycle Time (h:mm)	<input type="text" value="0:10"/>
Soak Time (h:mm)	<input type="text" value="0:20"/>
Flow	<input type="text" value="0.00"/>
Enabled	<input type="text" value="YES"/>
Programs: 1	<input type="button" value="Help"/>

2. In the **Zone** field, press the + or – button to select the zone that you want to set up as timed.
Note: The serial number of the biCoder assigned to this zone displays next to the Zone field. Descriptions from BaseManager display within the curly braces. For example, {South Lawn Rotors}.
3. Press the **Next** button to move to the **Zone Mode** field, and then press the + or – button until **Timed** displays in the field.
4. Press the **Next** button to move to the **Water Time** field.
 - To change the value in the hours place, press the + button.
 - To change the value in the minutes place, press the **Next** button, and then press the + or – button.

Tip: Let the controller calculate the cycle time and soak time settings for you. Press the Next button to move to the minutes placeholder in the Soak Time field, and then press the Back button. The controller divides the time in the Water Time field by 3. This value is used for the cycle time and the default soak time is 30 minutes.
5. Press the **Next** button to move to the **Cycle Time** field. If you are using soak cycles for this zone, the cycle time defines the duration of each watering cycle interspersed with soak times.
6. Press the **Next** button to move to the **Soak Time** field. If you are using soak cycles for this zone, the soak time defines the duration of each soaking cycle interspersed with watering times.
7. Press the **Next** button to move to the **Flow** field. If you know the gallons per minute flow for this zone, you can press the + or – button to enter it in this field. You can also perform a Learn Flow operation to update this field. Refer to Learning Flow by Zone on page 77.
8. Verify that the number displayed in the **Program** field in the upper-left corner of the screen matches the program in which you want to set up the timed zone.
 - If you want to set up the timed zone in a different program, press the **Next** button to move to the **Program** field, and then press the + or – button to change the program number.
 - If you want to remove a zone from one program and assign it to a different program, refer to Configuring Zone Settings on page 34.
9. Press the **Next** button to move to the **Enabled** field, and then press the + or – button to toggle between YES and NO. Set the value to **YES**.
10. After you have configured the settings for the current zone, perform one of the following actions:
 - To configure another zone, press the **Enter** button until the number of the zone that you want to configure displays in the **Zone** field at the top of the screen. Repeat steps 3 – 9.
 - When you have finished making changes, turn the dial to the **RUN** position.

Setting Up a Primary Zone

A primary zone is the zone within a scheduling group that all other linked zones are linked to. Changing the programming on this zone will adjust the programming on all linked zones, resulting in consistency and efficiency. If you are using a biSensor, the primary zone is the zone where the sensor is located. A zone can be a primary zone in more than one program.

Note: The primary zones of a program always run first.

Prerequisites

- biCoders have been assigned to zones.
- If you are using soil moisture sensors, they have been installed and detected by the controller.
- You know the number of the zone that waters the area where the sensor is installed.

To assign a primary zone

1. Turn the dial to the **Zones** position.
2. Verify that the number displayed in the **Program** field matches the program in which you want to set up the primary zone. If the zone is enabled in multiple programs and you want to set up the primary zone in a different program, press the + or – button to change the program number.

Note: A zone can be a primary zone in more than one program.

3. Press the **Next** button to move to the **Zone** field, and then press the + or – button to select the zone that you want to assign as a primary zone.
4. Press the **Next** button to move to the **Zone Mode** field.
5. Press the + or – button until **Primary** displays in the **Zone Mode** field.

Note: If you change the mode of a zone to Primary or from Primary to another mode, you will potentially affect the programming of other zones. For example, a primary zone has 20 linked zones. If you change the mode of the primary zone to linked or timed, the links to the 20 zones will be broken.

6. Repeat steps 2 – 5 for each primary zone with a biSensor.
7. When you have finished making changes, turn the dial to the **RUN** position.

Zones	
1	Zone [E012471] 1
<div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid black; padding: 5px; width: 60%;"> <p>Primary Zone Confirmation</p> <p>NOTE: Changing the mode of a zone to Primary or from Primary to another mode will affect the programming of other</p> <p>Press ENTR to make this change</p> <p>Press any other key to continue</p> </div> <div style="width: 35%;"> <p>Primary</p> <p>0:45</p> <p>0:15</p> <p>0:30</p> <p>0.00</p> <p>YES</p> </div> </div>	
Programs: 1	Help

Linking Zones (Creating a Scheduling Group)

To make programming easier and more structured, the BaseStation 3200 provides a way to group zones that have similar watering requirements. You create a scheduling group by designating a zone within the group as the primary zone and then configuring the other zones in the group as linked. These settings allow you to change the program for the primary zone and then automatically apply those changes to the linked zones. For example, if your group has 10 zones, you only need to make changes to the primary zone, and then all the changes will be automatically applied to the other 9 zones.

1. Perform the procedure in Setting Up a Primary Zone (on page 46) first.
2. Turn the dial to the **Zones** position.
3. Verify that the number displayed in the **Program** field in the upper-left corner of the screen matches the program in which you want to set up the scheduling group. If the zone is enabled in multiple programs and you want to set up the scheduling group in a different program, press the **Next** button to move to the **Program** field, and then press the + or – button to change the program number.

Note: A zone can be a primary zone in more than one program.

4. In the **Zone** field, press the + or – button to select the zone that you want to link.
5. Press the **Next** button to move to the **Zone Mode** field.
6. Press the + button to change the entry in the field so it shows **Linked-#**.
7. To continue linking zones, press the **Enter** button until the number of the zone that you want to link displays in the **Zone** field at the top of the screen.
8. Repeat steps 6 and 7 until you have linked all the zones in the group to the primary zone for that group.
9. When you have finished making changes, turn the dial to the **RUN** position.

Adjusting the Water Time Tracking Ratio of Linked Zones

You can change the water time tracking ratio of a linked zone in order to allow different water times for zones within a group of linked zones. When the tracking ratio of a linked zone is set to 75% of the primary, the zone will run for that percentage of the water time of the primary zone (for example, if the primary zone is set to water for 60 minutes and the linked zone tracking ratio is set to 75%, the linked zone will water for 45 minutes because 75% of 60 is 45). If you change the water time for the primary zone, each linked zone will be adjusted according to its tracking ratio value.

1. Turn the dial to the **Zones** position.
2. Verify that the number displayed in the **Program** field matches the program in which you want to adjust the tracking ratio. If the zone is enabled in multiple programs and you want to adjust the tracking ratio in a different program, press the **Next** button to move to the **Program** field, and then press the + or – button to change the program number.
3. In the **Zone** field, press the + or – button to select the zone that you want to adjust the water time tracking ratio for.
4. Press the **Next** button to move to the **Water Time** field.
5. Press the + button to change the entry in the field.

Zones	
<input type="text" value="1"/>	Zone [E012472] <input type="text" value="2"/>
Program	Zone2 Description
Zone Mode	<input type="text" value="Linked-1"/>
Water Time (100%)	<input type="text" value="0:45"/>
Cycle Time (h:mm)	<input type="text" value="0:15"/>
Soak Time (h:mm)	<input type="text" value="0:10"/>
Flow	<input type="text" value="0.00"/>
Enabled	<input type="text" value="YES"/>
Programs: 1	<input type="button" value="Help"/>

Note: As you change the time in the field, the ratio percentage changes to indicate how the time is related to the amount of time that the primary zone is scheduled to water. The example in the illustration shows that 45 minutes is 100% of the watering time scheduled for zone 2, so you know that zone 1 is also scheduled to water for 45 minutes. In this example, if you were to increase the time in the Water Time field to 90 minutes, the ratio would change to 200% to indicate that 90 minutes is double the amount of time that zone 1 is scheduled to water.

6. To adjust the water time tracking ratio for other zones, press the **Enter** button until the number of the zone that you want to adjust displays in the **Zone** field at the top of the screen.
7. Repeat steps 3 through 5 until you have adjusted the water time tracking ratio for all the zones in the group.
8. When you have finished making changes, turn the dial to the **RUN** position.

Using Soak Cycles

Because each type of soil has a different rate at which it can absorb water, you should set up the cycle time 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.

It is especially useful to enable soak cycles when you are watering a slope.

To set up soak cycles for a zone

1. Turn the dial to the **Zones** position.
2. Verify that the number displayed in the **Program** field matches the program in which you want to set up the soak cycles. If the zone is enabled in multiple programs and you want to set up the soak cycles in a different program, press the + or – button to change the program number.
3. Press the **Next** button to move to the **Zone** field, and then press the + or – button to select the zone that you want to set up the soak cycles for.

Note: When you set the soak cycle times for a primary zone, the soak cycles will also be set for all linked zones. The cycle time for linked zones is calculated based on the tracking ratio of the primary zone cycle time. The soak times will be the same as that of the primary zone.

4. Press the **Next** button to move to the **Water Time** field.
 - To change the value in the hours place, press the + button.
 - To change the value in the minutes place, press the **Next** button, and then press the + or – button.

Note: When you change the water time setting for a linked zone, notice that a percentage displays to the left of the Water Time field. This percentage compares the new value with the value in the Water Time field for the Primary zone and establishes a tracking ratio. The ratio will be maintained when changes are made to the primary zone’s water time.

Tip: Let the controller calculate the cycle time and soak time settings for you. Press the Next button to move to the minutes placeholder in the Soak Time field, and then press the Back button. The controller divides the time in the Water Time field by 3. This value is used for the cycle time and the default soak time is double the cycle time.

5. Press the **Next** button to move to the **Cycle Time** field. If you are using soak cycles for this zone, the cycle time defines the duration of each watering cycle interspersed with soak times.
 - To change the value in the hours place, press the + button.
 - To change the value in the minutes place, press the **Next** button, and then press the + or – button.

Note: You cannot change the cycle time setting for a linked zone.

6. Press the **Next** button to move to the **Soak Time** field. If you are using soak cycles for this zone, the soak time defines the duration of each soaking cycle interspersed with watering times.
 - To change the value in the hours place, press the + button.
 - To change the value in the minutes place, press the **Next** button, and then press the + or – button.

Note: You cannot change the soak time setting for a linked zone.

7. When you have finished making changes, turn the dial to the **RUN** position.

In this example, the settings are shown for a 60-minute water time. Primary zone 1 waters for 20 minutes, and then allows that water to soak in for 40 minutes. While zone 2 is soaking, other zones can run. After the 40 minutes soak time, zone 2 will be allowed to run another 20 minutes after any zone that is currently running finishes.

With these settings, zone 1 completes its 1 hour of watering in three, 20-minute segments, with at least a 40 minute soak time between them.

Zones	
1	Zone [E012471] 1
Program	Zone1 Description
Zone Mode	Primary
Water Time (h:mm)	1:00
Cycle Time (h:mm)	0:20
Soak Time (h:mm)	0:40
Flow	0.00
Enabled	YES
Programs: 1	Help

When 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.

To disable soak cycles

1. Turn the dial to the **Zones** position.
2. Verify that the number displayed in the **Program** field matches the program in which you want to disable the soak cycles. If the zone is enabled in multiple programs and you want to disable the soak cycles in a different program, press the + or – button to change the program number.
3. Press the **Next** button to move to the **Zone** field, and then press the + or – button to select the zone that you want to disable the soak cycles for.

Note: When you disable the soak cycle for a primary zone, the soak cycle is disabled for all linked zones. The controller skips the linked zones when you press the + or – button to select a zone.

4. Press the **Next** button to move to the **Cycle Time** field, and then press the **Back** button to change the value in the field to 0:00.
5. Press the **Next** button to move to the **Soak Time** field, and then press the **Back** button to change the value in the field to 0:00.
6. When you have finished making changes, turn the dial to the **RUN** position.

Setting Up Programs

The BaseStation 3200 supports 99 programs. The controller identifies each program with a number.

In many irrigation controllers, you set up the water times and the watering schedules in the programs, but in the BaseStation 3200, water times are configured for the individual zones, and a program provides the schedule for when the associated zones will water. The schedule has the following components:

Start Times – Each program can have up to eight start times in a 24 hour period. Start times are set in 5 minute increments from the top of the hour.

Start Days – If there are watering restrictions in your area, you might be able to use one of the pre-configured day interval options in the controller to comply with the restrictions. Options are a seven day schedule, even days of the month, odd days of the month, odd days of the month excluding the 31st day of the month, fixed intervals, and historical ET calendar (explained in the topic on setting up historical calendar watering for a program on page 53).

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.

Concurrent Zones – Concurrent zones are 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. You must also set the total number of concurrent zones for the controller.

Advanced Setup – Each program has a watering priority (high, medium, low). When start events are hit, the program with the highest priority gets first call on the water and time. A higher priority program will pre-empt lower priority programs and will run to completion before the lower ones.

To set up the start times for a program

1. Turn the dial to the **Programs** position.
2. The **Program Start Times Setup** option should be highlighted. If it is not highlighted, press the **Next** button to highlight it.
3. Press the **Enter** button. The Start Times screen displays.
4. Verify that the number displayed in the **Program** field matches the program that you want to set start times for. If you want to select a different program, press the **+** or **-** button to change the program number.

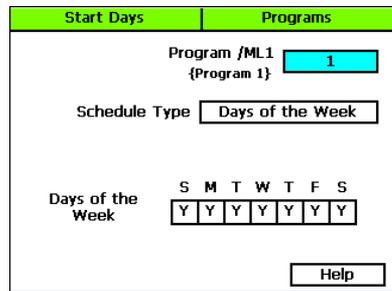
Note: If you have assigned this program to a mainline, the mainline number displays after the slash in the field label. Example, /ML1

Start Times	Programs		
Program /ML1			
{Program 1}			1
12:00A	-	-	-
-	-	-	-
Help			

5. Press the **Next** button to move to the start times grid.
6. Press the + or – button to set the time in the first cell.
7. Press the **Next** button to move to the next cell in the start times grid, and then press the + or – button to set additional start times as needed.
8. After you have configured the start times for the current program, perform one of the following actions:
 - To configure start times for another program, press the **Enter** button until the number of the program that you want to configure displays in the **Program** field at the top of the screen. Repeat steps 5 – 7.
 - When you have finished making changes, turn the dial to the **RUN** position.

To set up the start days for a program

1. Turn the dial to the **Programs** position.
2. Press the **Next** button to highlight the **Program Start Days Setup** option, and then press the **Enter** button. The Start Days screen displays.
3. Verify that the number displayed in the **Program** field matches the program that you want to set start days for. If you want to select a different program, press the + or – button to change the program number.
4. Press the **Next** button to move to the **Schedule Type** field where you can select one of the following intervals:
 - **Days of the Week** – After you select the Days of the Week option, press the **Next** 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 Y (Yes), which indicates that the program will start every day. If you want to change a start day, press the **Next** button to select the day, and then press the + or – button to change the setting.
 - **Interval Days** – This option enables you to set up a custom interval for the program start days. Press the **Next** button to move to the **Watering Interval Days** field, and then press the + or – button to change the setting. The next start date is calculated and entered in the Next Start field. If you want to change the next start date, press the **Previous** button to highlight the **Next Start** field, and then press the – button to change the date.



- **Days of the Week** – After you select the Days of the Week option, press the **Next** 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 Y (Yes), which indicates that the program will start every day. If you want to change a start day, press the **Next** button to select the day, and then press the + or – button to change the setting.
- **Interval Days** – This option enables you to set up a custom interval for the program start days. Press the **Next** button to move to the **Watering Interval Days** field, and then press the + or – button to change the setting. The next start date is calculated and entered in the Next Start field. If you want to change the next start date, press the **Previous** button to highlight the **Next Start** field, and then press the – button to change the date.
Note: You can decrease the start date, but you cannot increase it.
- **Even Days** – Select **Even** to start the program only on the even numbered days of the month.
- **Odd Days** – Select **Odd** to start the program only on the odd numbered days of the month.

- **Odd Skip 31** – Select **Odd Skip 31** to start the program only on the odd numbered days of the month, but skip the 31st day in order to maintain an every-two-day schedule when crossing to a new month.
 - **Historical Calendar** – Using the **Historical Calendar** watering schedule you can set up custom start day intervals for the first half and second half of every month of the year. This watering schedule works best in regions where landscapes are irrigated all year. Refer to the topic on setting up program start days based on a historical calendar on page 53.
5. After you have configured the start days for the current program, perform one of the following actions:
- To configure start days for another program, press the **Enter** button until the number of the program that you want to configure displays in the **Program** field at the top of the screen. Repeat step 4.
 - When you have finished making changes, turn the dial to the **RUN** position.

Note: A program that is started on one day will continue to run until it completes, even if it needs to continue to the next day, which may or may not be a watering day. For example, if a six-hour program starts at 10 PM on Monday, it will finish at 4 AM on Tuesday, even if Tuesday is not a watering day.

To set up program start days based on a historical calendar

In the BaseStation 3200, one of the Start Day modes for a program is Historical Calendar. A historical calendar uses ET (evapotranspiration) data to predict how frequently you will need to irrigate over the course of an entire year. ET refers to the loss of moisture from the soil by evaporation and by the transpiration of plants. Factors such as air temperature, humidity, solar radiation, and wind speed affect the rate at which ET occurs. Scientists with the National Oceanic and Atmospheric Administration (NOAA) continuously monitor climate data in all regions of the United States. When this data is averaged over a 30 year period, historical ET values are generated for each month of the year.

The Historical Calendar mode enables you to set up a watering schedule for the entire year that compensates for seasonal changes without your having to adjust times and frequency multiple times throughout the year.

If you set up a water time that applies $\frac{1}{2}$ - $\frac{3}{4}$ inch of water and then you change the frequency of watering based on the historical ET needs for your area, the controller will water deeply and less frequently. This watering method encourages the roots of your plants to grow deep.

Prerequisites

- Set zone water times that will apply $\frac{1}{2}$ - $\frac{3}{4}$ 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 the amount of moisture used by your plant material since the last irrigation event. Use the ET deficit data to determine the watering frequency.

Note: If you combine the Historical Calendar mode with the upper limit watering strategy using biSensors, you will have a very effective watering schedule. The biSensor will monitor the soil moisture in real-time and compensate for non-historical weather behavior by making fine adjustments to the water time.

Programming Instructions

1. Turn the dial to the **Programs** position.
2. Press the **Next** button to highlight the **Program Start Days Setup** option, and then press the **Enter** button. The Start Days screen displays.
3. Verify that the number displayed in the **Program** field matches the program that you want to set the historical calendar watering schedule for. If you want to select a different program, press the **+** or **-** button to change the program number.
4. Press the **Next** button to move to the **Schedule Type** field. Press the **+** button to move through the options, and then stop when **Historical Cal** is displayed in the field.
5. Press the **Next** button to move to the **Next Start** field. The date is calculated based on today's date and the preconfigured interval.

6. Press the **Next** button to move to the **Day Interval Calendar**. The selected day interval is indicated by a colored box on a number. The date field displays the half month that is represented by that number.

This box represents January, the other boxes represent the remaining months of the year in order.

Selected day interval, which represents the displayed date range.

Start Days	Programs																								
Program /ML1 <input type="text" value="1"/>																									
Program 1																									
Schedule Type <input type="text" value="Historical Cal"/>																									
Next Start >= <input type="text" value="5/18/2012"/>																									
Historical Calendar Date: <input type="text" value="JAN 1-15"/>																									
<table border="1"> <tr> <td>7</td><td>6</td><td>6</td><td>6</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td><td>2</td><td>2</td><td>2</td> </tr> <tr> <td>2</td><td>2</td><td>2</td><td>2</td><td>3</td><td>3</td><td>3</td><td>4</td><td>6</td><td>6</td><td>6</td><td>7</td> </tr> </table>		7	6	6	6	4	3	3	3	3	2	2	2	2	2	2	2	3	3	3	4	6	6	6	7
7	6	6	6	4	3	3	3	3	2	2	2														
2	2	2	2	3	3	3	4	6	6	6	7														
<input type="button" value="Help"/>																									

Note: The calendar displays 12 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.

- To increase or decrease the selected day interval, press the **+/-** buttons.
 - To turn watering off during the selected day interval, press the **-** button to set the number to zero.
 - To move to and select a different day interval, press the **Next** button.
7. When you have finished configuring the Historical Calendar settings, turn the dial to the **RUN** position.

Note: If you set up multiple programs to use the Historical Calendar settings, be sure to set the program start dates so the interval is staggered. Refer to Setting Up the Start Days for a Program on page 52.

To set up the water windows for a program

Water windows tell the controller when watering is allowed and not allowed. You can set water windows for either Weekly (shown on illustration below) or daily – when moving from weekly to daily, the weekly settings are copied to each day of the week.

Selecting daily water windows gives you hourly control of watering for each day of the week, and for each program. A white square will pause watering for that hour, or keep a start time from starting a program.

1. Turn the dial to the **Programs** position.
2. Press the **Next** button to select the **Program Water Windows Setup** option. The Water Windows screen displays.
3. Press the + or – button to select the program that you want to set up water windows for.
4. Press the **Next** button to move to the **Water Window Type** field, and then press the + or – button to select either Weekly or Daily.

Note: If you use “Weekly” to set up the water windows and then you decide to convert to “Daily,” the weekly settings are copied to each day of the week.

Water Windows		Programs										
Program /ML1		1										
Program i												
Water Window Type		Weekly										
Day of the Week		All Week										
ENTR to set All hours to		OFF										
Allow Watering <input type="checkbox"/>		Do Not Allow Watering <input type="checkbox"/>										
AM	12	1	2	3	4	5	6	7	8	9	10	11
PM	12	1	2	3	4	5	6	7	8	9	10	11
Help												

Selecting daily water windows gives you hourly control of watering for each day of the week and for each program.

5. Press the **Next** button to move to the **Day of the Week** field. If you are using the “Weekly” Water Window Type, you cannot change the setting in this field, but if you are using “Daily,” press the + or – button to display the day of the week that you want to set up water windows for.
6. Press the **Next** button to move to the **ON/OFF** field.
 - If the boxes in the grid are blue (allow watering), the field displays **OFF**. Press the **Enter** button to turn all the water windows off.
 - If the boxes in the grid are white (do not allow watering), the field displays **ON**. Press the **Enter** button to turn all the water windows on.
7. To make changes to the individual boxes in the grid, press the **Next** button. The color of the number in the first box of the grid changes to red (indicating that you can change the setting in that box).
 - To change the water setting for the time/day represented by that grid, press the + button.
 - To move to next box in the grid, press the **Next** button.

Note: If you want to set up daily water windows, start by setting a basic profile in weekly mode, and then change to daily mode to modify specific days (like a mow day). Pressing the Enter button will maintain the current selected field and advance through the days of the week.

- When you have finished making changes, turn the dial to the **RUN** position.

To set up concurrent zones for a program

Concurrent zones are 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. You can also set the total number of concurrent zones for the controller.

In the BaseStation 3200, you manage the number of zones that can run concurrently at the following levels:

- Mainline Flow Level** – When you set up the design flow for the mainline and then set the Concurrent Zones by Flow field to YES, the system uses the mainline design flow to determine how many zones can run concurrently up to the program limits. Refer to Setting Up Mainline Operating Limits on page 74.
- Program Level** – If you want a program to water more than one zone at a time, you must configure the Concurrent Zone settings at the program level.

Even if your system does not have a flow device, you can still use the Concurrent Zone settings at the program level without having to input design flows for all zones and the mainline.

When you have one or more flow devices, a good strategy is to set the program concurrency limits to a reasonable maximum and then decrease specific programs that have some special considerations (such as, the mainline branch is smaller, longer, or you want to slow the completion time of a program, or if the two-wire length is very long and you want to control the voltage drop by limiting the current to those valves).

- Turn the dial to the **Programs** position.
- Press the **Next** button to select the **Concurrent Zones Setup** option. The Concurrent Zones screen displays.
- In the **Program** column, press the + or – button to select the program that you want to set up concurrent zones for.
- Press the **Next** button to move to the **Concurrent Zones** column, and then press the + or – button to change the value in the field.

Note: Consider electrical and water constraints when you are setting up concurrent zones.

- Press the **Next** button to move to the **Total Allowed** field, and then press the + or – button to change the value in the field. This field indicates the number of concurrent zones for all programs added together.

Concurrent Zones		Programs	
		Program	Concurrent Zones
	-	-	-
	-	-	-
	1	1	1
	2	1	1
	3	1	1
	4	1	1
Total Allowed			1
			Help

- When you have finished making changes, turn the dial to the **RUN** position.

To set the priority for a program

When a start event is reached, the program with the highest priority gets first call on the water and time.

A higher priority program “preempts” lower priority programs and runs to completion before the lower ones.

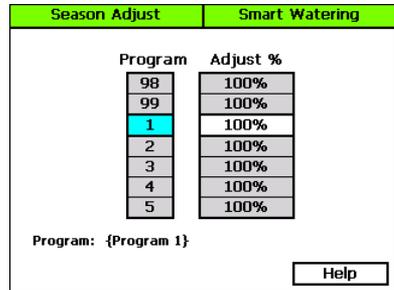
1. Turn the dial to the **Programs** position.
2. Press the **Next** button to select the **Advanced Programs Setup** option. The Advanced screen displays.
3. In the **Program** field, press the + or – button to select the program that you want to set the priority for.
4. Press the **Next** button to move to the **Enabled** field. When **True** displays in the field, the program is enabled. If you want to disable the program, press the + or – button so **False** displays in the field.
5. Press the **Next** button to move to the **Water Priority** field, and then press the + button to select one of the following priorities:
 - **High** – The program that you want to run first
 - **Medium** – The program that you want to run after your high priority programs have finished running
 - **Low** – The program that you want to run after all other programs have run
6. After you have configured the settings for the current program, perform one of the following actions:
 - To configure another program, press the **Enter** button until the number of the program that you want to configure displays in the **Program** field at the top of the screen. Repeat step 4.
 - When you have finished making changes, turn the dial to the **RUN** position.

Advanced	Programs
Program {Program 1}	<input type="text" value="1"/>
Enabled	<input type="text" value="True"/>
Water Priority	<input type="text" value="Medium"/>
<input type="text" value="Help"/>	

To adjust programs for seasonal variations

In order to provide a full range of functionality, the BaseStation 3200 controller firmware includes an option to increase or decrease the amount of time all zones in a program will water. However, we recommend that you use other methods for adjusting the amount of water that your irrigation system is putting down. A healthier way to water turf is to always water deep (about the same amount of time) and change the frequency of watering to maintain the correct moisture level. Use the Day Intervals schedule for better results. Refer to Setting up the day intervals for a program on page 52.

1. Turn the dial to the **Smart Watering** position.
2. Press the **Next** or **Previous** button to select **Program Seasonal Adjust**, and then press the **Enter** button. The Season Adjust screen displays and shows all programs set to 100%.
3. Press the **+** button to move to the program where you want to adjust the percentage.
4. Press the **Next** button to move to the **Adjust %** column.
5. Press the **+** or **-** button to change the percentage. You can set the percentage between 10 and 500%.
6. After you have configured the settings for the current program, perform one of the following actions:
 - To configure another program, press the **Enter** button until the number of the program that you want to configure displays in the **Program** field at the top of the screen. Repeat steps 4 and 5.
 - When you have finished making changes, turn the dial to the **RUN** position.



Associating Zones with a Program

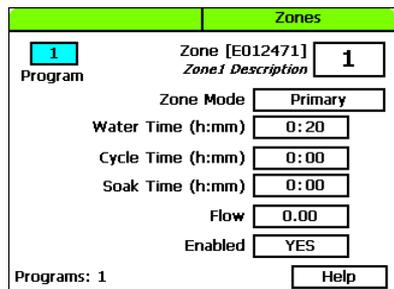
In your landscape, you probably have zones that need to be watered every day (such as those that water annuals in full sun) and other zones that need to be watered less frequently (such as shrub borders). In order to manage these different watering schedules, it is best to create separate programs for the annuals and the shrubs and then associate the zones that water the specific landscape area with the appropriate program.

Prerequisites

- The zones have been correctly assigned in the controller.
- You know the numbers of the zones that water the specific landscape areas.

Programming Instructions

1. Turn the dial to the **Zones** position. The Zones screen displays.
2. In the **Zone** field, press the **+** or **-** button to select the number of the zone that you want to associate with a program.
3. Press the **Previous** button to go to the **Program** field.
4. Press the **+** or **-** button to select the program



that you want the zone to be associated with.

- Complete the other zone fields according to the instructions in Configuring Zone Settings on page 34.

Note: Zones can be associated with multiple programs. Whenever a zone has a water time set in a program, the zone is associated with the program. The programs that the zone is associated with are shown in the lower-left corner of the screen.

- Repeat steps 2 – 5 to associate all zones with a specific program.
- When you have finished making changes, turn the dial to the **RUN** position.

Removing a Zone from a Program

Zones can be associated with multiple programs. Whenever a zone has a water time set in a program, the zone is associated with the program. The programs that the zone is associated with are shown in the lower-left corner of the screen.

- Turn the dial to the **Zones** position. The Zones screen displays.
- In the **Zone** field, press the + or – button to select the number of the zone that you want to remove from a program.
- Press the **Previous** button to go to the **Program** field.
- Press the + or – button to select the program that you want the zone to be removed from.
- Press the **Next** button to move to the **Water Time** field.
- When the hours placeholder is highlighted, press the – button to remove the time from the **Water Time** field.
- When you have finished making changes, turn the dial to the **RUN** position.

Zones	
2	Zone [Q006641] 3
Program	Zone? Description
	Zone Mode -
	Water Time (h:mm) :-
	Cycle Time (h:mm) :-
	Soak Time (h:mm) :-
	Flow 0.00
	Enabled YES
Programs: 1	Help

Setting Up Soil Moisture Sensor Based Watering

You can take the guesswork out of your watering decisions by setting up soil moisture sensor based watering. The biSensor measures soil moisture where the plants need it – at the root level.

When you have a biSensor installed, the BaseStation 3200 enables you to set up one of the following water strategies:

- Timed** – Waters without biSensor control, but provides a log of daily moisture levels.

Note: Be sure to use the Timed water strategy with new grass. After the root zone is established, you can change to one of the other strategies.

- **Lower Limit** – Prevents watering until the moisture level drops below the limit, and then a full water cycle will run. The user sets and manages the limit and the water time.
- **Upper Limit** – Allows watering at each start time, but the water time is adjusted to replenish the moisture to field capacity. The user sets and manages the limit and the base water time. Ensure that ½ inch or more of water is applied frequently enough to water sufficiently during the hottest period of the season.
 - Make sure that you have soak cycles properly set up for the zones that will be using soil moisture based watering. In addition to allowing the applied water to soak into the soil, soak cycles allow time for the water to reach the biSensor depth so the soil moisture readings are accurate. Refer to Using Soak Cycles on page 49.

Prerequisites for Watering with Soil Moisture Sensors

- Your biSensors are installed and assigned in the BaseStation 3200. Make sure to assign the correct biSensor to its primary zone in the correct program. Making an incorrect assignment here will result in unexpected and confusing water behavior. Refer to Searching For and Assigning biSensors on page 38.
- You have created scheduling groups (a primary zone with linked zones) that combine areas with similar watering needs (hydrozones). For example, the zones that water the softball field would be in one scheduling group and the zones that water the north lawn between the sidewalk and the building would be in another scheduling group. Refer to Linking Zones (Creating a Scheduling Group) on page 47.

To configure your biSensors and set up watering strategies

1. Turn the dial to the **Smart Watering** position.
2. Press the **Next** button to select **Moisture biSensor Setup**, and then press the **Enter** button. The biSensor Setup screen displays.
3. If you have more than one biSensor installed and assigned to a primary zone in more than one program, verify that the correct primary zone and program displays in the **Primary Zone/Prg** field (the serial number of the assigned biSensor displays below the field). If the biSensor that you want to configure is not displayed below the field, press the **+** or **-** button to select the correct one.
4. Press the **Next** button to move to the **Water Strategy** field, and then press the **+** or **-** button to select the water strategy that you want to use.

biSensor Setup	Smart Watering
Primary Zone/Prg	Zone 1 / Prg 1
biSensor	SB01130
Water Strategy	Lower Limit
Lower Limit (turn on)	26.0%
Limit Adjustment	0.0 %
Calibration Cycle	One Time
biSensor: {Moisture biSensor SB01130}	
Zone: {Zone 1}	
Help	

IMPORTANT NOTE! If you select the Upper or Lower Limit strategies, be sure to read the information below for a complete explanation of these strategies.

5. Press the **Next** button to move to the **Upper/Lower Limit** field (the field that displays depends on the water strategy that you selected). Press the **+** or **-** button to change the number in the field.

6. Press the **Next** button to move to the **Limit Adjustment** field.

Note: This field is typically used to offset the limit set by a calibration cycle. If you think that you might need to use this field, contact Baseline Support for help.

7. Press the **Next** button to move to the **Calibration Cycle** field.

- **Never** – No calibration cycle will be performed
- **One Time** – A single calibration cycle will be performed at the next start time
- **Monthly** – A calibration cycle will be performed each month at the first start time

Note: Calibration cycles require that soak cycles be enabled. When you set these watering strategies, soak cycles will be automatically enabled. You may change the settings to meet your specific needs, but if you disable the soak cycles, the calibration cycle will fail.

8. When you have finished making changes, turn the dial to the **RUN** position.

Note: If for any reason the biSensor becomes damaged or fails (12 hours of failed data or communication) the corresponding primary zone and linked zones will water based on a timed operating mode which is based on set water times and program schedule.

Understanding Lower & Upper Limit Watering Strategies

Lower Limit

This water strategy provides an excellent way to achieve healthy, deep-rooted grass. You can either set the lower limit manually or you can have the controller perform a calibration cycle in order to calculate the limit. Set the lower limit at the maximum allowable depletion moisture level, just before the lawn begins to stress or wilt.

When you choose the Lower water strategy, you must set and then manage the lower watering limit. This water strategy works well when you are not constrained by specific water days. Schedule the program to water every day, and then let the biSensor determine which days to skip by monitoring the moisture level. The controller only waters when the moisture level has dropped below the lower limit, and then a full watering cycle runs.

The best way to set the lower limit is to have the controller do an initial calibration cycle. Set the Calibrate field to One Time. The calibration cycle will run during the first normally scheduled water time that is at least two days after the biSensor installation. The system sets an initial lower limit based on the calibration.

You have the option to adjust the auto limit by entering a value in the Limit Adjustment field. This adjustment is added to the limit to make the soil a little wetter or a little drier than the controller set limit.

Lower Limit Programming Requirements

- Set zone water times to apply $\frac{1}{2}$ - $\frac{3}{4}$ inch of water
- Set program to start every day of the week as allowed by local watering restrictions (the biSensor will block watering until it is needed)

- Enable soak cycles
- Use the default lower limit water strategy to begin with
 - The first calibration cycle occurs on the first start time after a biSensor has been installed for at least 48 hours.
 - A calibration cycle will calculate limits 12 to 15 hours after watering is complete on the primary zone.
 - A calibration cycle will extend the programmed zone water time if needed to determine the soil saturation point - if the ground is very dry (or if the water time is too short), the water time could extend to twice the programmed time.
 - If a calibration cycle cannot determine the soil saturation point, the calibration cycle will fail – posting an alert and setting a default limit.

Lower Limit Watering Behaviors

- It is uncertain which days of the week when watering will occur – use water windows or block a day to specify a mow day.
- The water time for a program is fixed, so the end time is predictable to the extent that multiple programs may all be trying to water on the same day.

Upper Limit

This water strategy varies the zone water time each time the program runs in order to apply enough water to raise the moisture level to field capacity. Soak cycles are critical for this mode because the controller monitors the moisture level as water is applied. At the end of each soak cycle, the controller determines whether an additional water cycle is needed. After the upper limit has been reached, the controller will water for an additional 10% of the water time to increase deep watering.

When you choose the Upper Limit water strategy, you must set and manage the upper watering limit. You can have the controller perform an initial calibration cycle to establish the starting limit value. This calibration cycle will be run on the first start time, two days after the biSensor installation date. After the initial calibration cycle has been run, you must monitor the moisture levels and plant health so you can make adjustments as needed.

Upper limit watering starts a watering cycle on each start time for the primary zone and adjusts the watering time to raise the moisture level back up to the upper limit (field capacity). The controller increases or decreases the water time, but it never adjusts more than twice your initial water time.

Upper Limit Programming Requirements

- Set the zone water times to apply $\frac{1}{2}$ inch to $\frac{3}{4}$ inch of water
- Set the program to use Historical Calendar day intervals (or alternately, specific days of the week or fixed intervals)
- Enable soak cycles

Upper Limit Watering Behaviors

- The water schedule is known as far as what days watering will occur – use water windows to specify a mow day.
- The water time for a program is variable, so the end completion time is not predictable – if there are completion time constraints, this may not be a good water strategy.

Complying with Water Restrictions

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. You can use the moisture graphs to track the moisture depletion rate.

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 3200 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 an event day
- There isn't a rain sensor stop condition
- There isn't another controller stop condition (such as a high flow shutdown)

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:

- Water window (white square)
- Pause switch or pause biCoder
- Turning the dial to make a programming change – when the dial is left in a programming position, the controller will return to run mode in two hours just as if the dial had been move back to Auto/Run.

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.

Setting Up Start, Stop, and Pause Conditions

The BaseStation 3200 enables you to set up conditions based on the status of devices that will start, stop, or pause the entire controller or specific programs. You can use the following devices to monitor these conditions:

Event biCoder – Set up a switch, such as a coach’s button, to start, stop, or pause watering

Soil Moisture biSensor – Set up a soil moisture sensor to start, stop, or pause watering based on a specific reading

Air Temperature biSensor – Set up an air temperature sensor to start, stop, or pause watering based on a specific reading

To set up start, stop, pause conditions for event switches

1. Perform the steps in Searching For and Assigning Event Switches on page 36.
2. Turn the dial to the **Start, Stop, Pause** position.
3. Press the **Next** or **Previous** button to highlight the **Event biCoders Setup** option.

4. Press the **Enter** button. The Event biCoders screen displays.
5. In the **Program** column, press the **+** button to highlight the program that you want to set up the conditions for.

Note: Select All in the Program column to have the pause condition affect the entire controller.

Event biCoders		Start, Stop, Pause	
Pgm	Event biCoders	Contacts = Closed	
		Enable	Value
99	-	Start	<input type="button" value="Equals"/> <input type="button" value="Closed"/>
All	Search	Stop	<input type="button" value="Off"/> <input type="button" value=""/>
1	P000116	Pause	<input type="button" value="Off"/> <input type="button" value=""/>
2	-	Pause Time <input type="text"/>	
3	-		
4	-		
{Program 1}			
{Event biCoder P000116}			
			<input type="button" value="Help"/>

6. Press the **Next** button to move to the **Event biCoders** column. Press the **+** button to highlight the serial number of the event biCoder that you want to set up the conditions for.
7. Press the **Next** button to move to the **Enable** column of the **Start** field. Press the **+** button to toggle the setting between the following values:

- **Off** – Tells the controller to ignore this condition
- **Equals** – Start the program when the condition of the switch matches the setting in the Value column

Note: While the controller allows you to enable all of the start, stop, pause functions for a single program, it is best to use just one function per program.

8. Press the **Next** button to move to the **Value** column of the **Start** field. Press the **+** button to toggle the setting between Open and Closed.
9. Press the **Next** button to move to the **Enable** column of the **Stop** field. Press the **+** button to toggle the setting between Off and Equals.
10. Press the **Next** button to move to the **Value** column of the **Stop** field. Press the **+** button to toggle the setting between Open and Closed.

11. Press the **Next** button to move to the **Enable** column of the **Pause** field. Press the + button to toggle the setting between Off and Equals.
12. Press the **Next** button to move to the **Value** column of the **Pause** field. Press the + button to toggle the setting between Open and Closed.
13. Press the **Next** button to move to the **Pause Time** field. Press the + or – button to change the value in the field.
14. When you have finished making changes, turn the dial to the **RUN** position.

When the event switch detects a start, stop, or pause condition, it causes the controller to respond according to the settings and the status in the Last Pause field on the Detail Status screen is updated.

To set up start, stop, pause conditions for soil moisture sensors

1. Perform the steps in Searching For and Assigning Soil Moisture Sensors on page 37.
2. Turn the dial to the **Start, Stop, Pause** position.
3. Press the **Next** or **Previous** button to highlight the **Moisture Control Setup** option.

4. Press the **Enter** button. The Moisture biSensors screen displays.
5. In the **Program** column, press the + button to highlight the program that you want to set up the conditions for.
6. Press the **Next** button to move to the **Moisture biSensors** column. Press the + button to highlight the serial number of the soil moisture sensor that you want to set up the conditions for.

Moisture biSensors		Start, Stop, Pause	
Pgm	Moisture biSensors	Moisture 0.0% Enable	Value
99	-	Start	Below 26.0
All	Search	Stop	Off
1	SB01130	Pause	Off
2	-	Pause Time	
3	-		
4	-		

{Program 1}
{Moisture biSensor SB01130}

Help

7. Press the **Next** button to move to the **Enable** column of the **Start** field. Press the + button to toggle the setting between the following values:
 - **Off** – Tells the controller to ignore this condition
 - **Below** – Start the program when the soil moisture sensor detects a reading that is below the setting in the Value column
 - **Above** – Start the program when the soil moisture sensor detects a reading that is above the setting in the Value column
 - **Equals** – Start the program when the soil moisture sensor detects a reading that is equal to the setting in the Value column
8. Press the **Next** button to move to the **Value** column of the **Start** field. Press the + button to change the value in the field.
9. Press the **Next** button to move to the **Enable** column of the **Stop** field. Press the + button to toggle the setting between Off, Below, Above, and Equals.

10. Press the **Next** button to move to the **Value** column of the **Stop** field. Press the + button to change the value in the field.
11. Press the **Next** button to move to the **Enable** column of the **Pause** field. Press the + button to toggle the setting between Off, Below, Above, and Equals.
12. Press the **Next** button to move to the **Value** column of the **Pause** field. Press the + button to change the value in the field.
13. Press the **Next** button to move to the **Pause Time** field. Press the + or – button to change the value in the field.
14. When you have finished making changes, turn the dial to the **RUN** position.

When the soil moisture sensor detects a start, stop, or pause condition, it causes the controller to respond according to the settings and the status on the Detail Status screen is updated.

To set up start, stop, pause conditions for air temperature sensors

1. Perform the steps in Searching For and Assigning Air Temperature Sensors on page 38.
2. Turn the dial to the **Start, Stop, Pause** position.
3. Press the **Next** or **Previous** button to highlight the **Temperature Control Setup** option.

4. Press the **Enter** button. The Temperature biSensors screen displays.
5. In the **Program** column, press the + button to highlight the program that you want to set up the conditions for.
6. Press the **Next** button to move to the **Temperature biSensors** column. Press the + button to highlight the serial number of the air temperature sensor that you want to set up the conditions for.

Temperature biSensors		Start, Stop, Pause	
Pgm	Temperature biSensors	Temperature = 73.4	
99	-	Start	Enable Value
All	Search	Stop	Below 40.0 F
1	SB01130	Pause	Off
2	-	Pause Time	
3	-		
4	-		
{Program 1} {Moisture biSensor SB01130}			
<input type="button" value="Help"/>			

7. Press the **Next** button to move to the **Enable** column of the **Start** field. Press the + button to toggle the setting between the following values:
 - **Off** – Tells the controller to ignore this condition
 - **Below** – Start the program when the air temperature sensor detects a reading that is below the setting in the Value column
 - **Above** – Start the program when the air temperature sensor detects a reading that is above the setting in the Value column
 - **Equals** – Start the program when the air temperature sensor detects a reading that is equal to the setting in the Value column
8. Press the **Next** button to move to the **Value** column of the **Start** field. Press the + button to change the value in the field.

9. Press the **Next** button to move to the **Enable** column of the **Stop** field. Press the + button to toggle the setting between Off, Below, Above, and Equals.
10. Press the **Next** button to move to the **Value** column of the **Stop** field. Press the + button to change the value in the field.
11. Press the **Next** button to move to the **Enable** column of the **Pause** field. Press the + button to toggle the setting between Off, Below, Above, and Equals.
12. Press the **Next** button to move to the **Value** column of the **Pause** field. Press the + button to change the value in the field.
13. Press the **Next** button to move to the **Pause Time** field. Press the + or – button to change the value in the field.
14. When you have finished making changes, turn the dial to the **RUN** position.

When the air temperature sensor detects a start, stop, or pause condition, it causes the controller to respond according to the settings and the status on the Detail Status screen is updated.

Setting Up Event Days

The BaseStation 3200 supports eight event days. An event day stops all watering and keeps all programs from starting on that date. You can schedule an event day up to a year in advance.

An event day is from 12:00am – 11:59pm.

1. Turn the dial to the **Start, Stop, Pause** position.
2. Press the **Next** button to highlight the **Event Dates** option.

3. Press the **Enter** button. The Event Date/Time screen displays.
4. In the **Program** column, press the + button to highlight the program that you want to set up event dates for.

Event Date/Time	Start, Stop, Pause
Pgm	Stop Watering Date
99	1 10/14/2014
All	2 -
1	3 -
2	4 -
3	5 -
4	6 -
{Program 1}	7 -
	8 -

Help

5. Press the **Next** button to move to the **Stop Watering Date** column.
6. Press the + button to set the desired date.
7. If you want to set up another event day, press the **Enter** button to move to the next line, and then repeat step 6.
8. If you want to set up an event day for another program, press the **Previous** button to return to the **Program** column, and then press the + button to highlight the program that you want to set up event dates for.
9. Repeat steps 5 and 6 to set up the date.
10. When you have finished making changes, turn the dial to the **RUN** position.

Setting Up Rain Delay Days

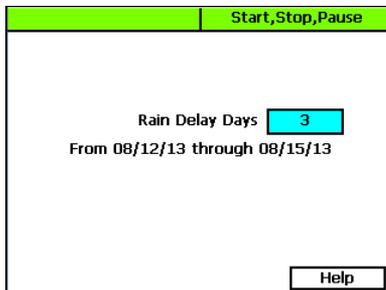
You can delay watering for up to 180 days with the Rain Delay setting. A rain delay stops all watering and keeps all programs for the programmed number of days starting on the current day.

The rain delay begins as soon as the command is submitted and ends at 11:59pm on the last scheduled day.

1. Turn the dial to the **Start, Stop, Pause** position.
2. Press the **Next** button to highlight the **Rain Delay Days** option.
3. Press the **Enter** button. The Start, Stop, Pause screen displays.
4. In the **Rain Delay Days** field, press the + button to set the number of days for the delay.

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

5. When you have finished making changes, turn the dial to the **RUN** position.



At the end of the scheduled rain delay, the controller will begin running normally. If you need to cancel a rain delay before it is scheduled to end, return to the rain delay screen and change the setting in the field to 0 (zero).

7 – Flow Management & Monitoring

The BaseStation 3200 provides 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 compare them against the expected or design flow rates and provide alerts and perform actions when limits or boundaries are exceeded. The system can reduce the overall completion time of a watering cycle by running the number of zones that best use the available water at each minute of the watering cycle.

To access the main menu for flow management, turn the dial to the Flow Menu position.

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 3200 has many capabilities that can improve the efficiency of your system.

Assigning Devices to Water Sources

The BaseStation 3200 supports 8 points of connection (POCs). You can assign pump/master valve devices, and flow meters to the POCs.

1. Turn the dial to the **Water Sources** position.
2. Press the **Next** button to highlight the **Assign Devices to Water Sources** option.
3. Press the **Enter** button. The Assign POCs screen displays.
4. In the **Point of Connection** field, press the + or – button to select the POC that you want to assign devices to.
5. Press the **Next** button to move to the **Pump/MV** field, and then press the + button to find the device that you want to assign.
6. Press the **Next** button to move to the **Pump/MV Type** field, and then press the + button to select one of the following options:
 - **Normally Closed** – A traditional valve biCoder
 - **Normally Open** – A traditional valve biCoder or part of a Flow+NOMV decoder
 - **Pump** – A traditional valve biCoder (or a pump relay biCoder)
7. Press the **Next** button to move to the **Flow biCoder** field, and then press the + button to find the device that you want to assign.
8. When you have finished making changes, turn the dial to the **RUN** position.

Assign POCs	Water Sources
Point of Connection {POC 1}	POC-1
Pump/MV1 Pump/MV Type {MV1}	D003329 Normally Closed
Flow biCoder1 {Flow biCoder 00W0268}	00W0268
POC1: Flow/00W0268, MV1/D003329	
Help	

Setting Up a Water Source

The BaseStation 3200 supports 8 points of connection (POCs). You can set limits and budgets for each POC.

You can set the following values for each flow device on the Setup POC screen:

Note: The step-by-step procedure for setting up the water source is on page 70.

- **Design Flow** – In this field, you can enter the specified gallons per minute (GPM) for the point of connection (POC) that supplies water through the flow device to the rest of the irrigation system. The BaseStation 3200 uses this value to manage the number of concurrent zones 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 zone concurrency.
- **High Flow Limit** – The system uses the GPM value in this field 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 set the Shut Down field to Y (yes), then programs using this POC will be stopped and corresponding master valves (MVs) will be shut off when the flow rate exceeds the limit.

If the flow device is a Flow+NOMV type, the flow limit is programmed into the flow device. The system monitors the high flow limit and the NOMV shuts off when the flow limit is exceeded. When a flow device is connected to external power, the NOMV will shut off even when the controller off or powered down.

- **Unscheduled Flow Limit** – When this limit is set to greater than zero, the system monitors the flow 24x7 for any flow that does not correspond to running programs.

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.

If the flow exceeds the limit for several minutes, the system generates an alert. If you set the Shut Down field to Y (yes), then the associated MVs will turn off.

- **Monthly Budget** – When the value in this field is greater than zero, the system monitors the total water used during a single month.

If the monthly water used exceeds this number, an alert is generated. If you set the Shut Down field to Y (yes), then the associated MVs shut off and water is stopped until the first of the next month.

To set up the water source

1. Turn the dial to the **Water Sources** position.
2. Press the **Next** button to highlight the **Water Sources (POCs) Setup** option.
3. Press the **Enter** button. The Setup POCs screen displays.

4. In the **Water Source** field, press the + button to select the POC that you want to set up.
5. Press the **Next** button to move to the **Use This POC** field, and then press the + or – button to toggle the setting between Enabled and Disabled.
6. Press the **Next** button to move to the **POC Priority** field, and then press the + or – button to set the priority as High, Medium, Low, or Off. The system will use the high priority water source first, and then switch to medium, and finally to low.

Setup POCs	Water Sources
Water Source	POC 1
Use This POC	Enabled
POC Priority	Off
Design Flow GPM	0.00
High Flow Limit GPM	0.00
Unscheduled Flow GPM	0.00
Monthly Budget GAL	0.00
Water Rationing	Disabled
POC1: Flow/00W0268, MV1/D003329	
POC Empty = SB01130	
	Shut Down
	-
	-
	-
	Help

Note: When you have multiple POCs on a mainline, the priority setting allows you to use the POC with the lowest cost of water first (high priority), but you can only set priorities when you have a normally closed master valve installed on the POCs. Use the Off setting for POCs that do not have flow meters or master valves.

7. Press the **Next** button to move to the **Design Flow GPM** field, and then press the + or – button to enter the amount of flow in gallons per minute (GPM) that is allowed through this point of connection for the irrigation system.
8. Press the **Next** button to move to the **High Flow Limit GPM** field, and then press the + or – button to enter the maximum amount of flow in gallons per minute.
9. Press the **Next** button to move to the **Shut Down** field. If you want programs using this POC to be stopped and corresponding MVs shut off when the flow rate exceeds the limit, press the + button to enter a **Y** (yes) in the field. If you do not want excessive flow to shut down the system, enter an **N** (no) in the field.
10. Press the **Next** button to move to the **Unscheduled Flow Limit GPM** field, and then press the + or – button to enter the maximum amount of unscheduled flow in gallons per minute.
11. Press the **Next** button to move to the **Shut Down** field. If you want the associated MVs to turn off when an unscheduled flow exceeds this limit, press the + button to enter a **Y** (yes) in the field. If you do not want excessive flow to shut down the system, enter an **N** (no) in the field.
12. Press the **Next** button to move to the **Monthly Budget GAL** field, and then press the + or – button to enter the maximum amount of water that can be used per month in gallons.
13. Press the **Next** button to move to the **Shut Down** field. If you want the associated MVs to turn off when the amount of water used exceeds this limit, press the + button to enter a **Y** (yes) in the field. If you do not want excessive water use to shut down the system, enter an **N** (no) in the field.

- Press the **Next** button to move to the **Daily Water Rationing** field. To enable water rationing, press the **+** button to display **Enabled** in the field. When you enable water rationing, the system determines the daily water ration by dividing the number of gallons in the Monthly Budget field by the number of days in the month. The system will use only the ration amount for daily watering. If a day is skipped, that water ration is available the next day.

Setting Up Empty Conditions for a POC

If one of your water sources is a cistern or reservoir, you can install a moisture sensor or an event switch (float) to monitor the water level and stop using that water source when the water drops below a specified level.

- Turn the dial to the **Water Sources** position.
- Press the **Next** button to highlight the **Water Sources (POCs) Setup** option.
- Press the **Enter** button. The Empty Conditions screen displays.

- In the **POC** column, press the **+** or **-** button to select the POC that you want to set up the condition for.

- Press the **Next** button to move to the **Devices** column, and then press the **+** or **-** button to select the device that you want to monitor the condition.

Empty Conditions		Water Sources	
POC	Devices	Moisture biSensor Last Reading = 0.0%	
-	-	Use Device	<input type="text" value="Enabled"/>
-	Search	Empty <	<input type="text" value="25.0%"/>
1	SB01130	Wait h:m	<input type="text" value="0:05"/>
2	P000116		
3	-		
4	-		
{POC 1}			
POC1: Flow/00W0268, MV1/D003329			
POC Empty = SB01130			<input type="text" value="Help"/>

- Press the **Next** button to move to the **Use Device** field. To enable the sensor to monitor the volume of water in the POC, press the **+** button to display **Enabled** in the field.
- Press the **Next** button to move to the **Empty** field.
 - If you are using an event switch to monitor the condition, press the **+** button toggle the value in the field between **Open** and **Closed**.
 - If you are using a soil moisture sensor to monitor the condition, press the **+** or **-** button to enter the moisture reading that indicates when the cistern or reservoir is empty.
- Press the **Next** button to move to the **Wait Time** field, and then press the **+** or **-** button to enter the amount of time that you want the system to wait before reading the sensor again.
- When you have finished making changes, turn the dial to the **RUN** position.

Setting Up a Booster Pump for a Program

If you have some zones that require additional pressure or flow (such as a sports field with large rotors), you can install a booster pump to increase the pressure. The BaseStation 3200 allows you to assign a master valve decoder as a booster pump.

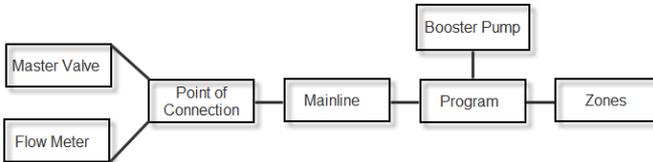
- Turn the dial to the **Water Sources** position.

- Press the **Next** button to highlight the **Booster Pumps Program Setup** option.
- Press the **Enter** button. The Booster Pumps screen displays.
- In the **biCoder** field, press the **+** button to select the master valve biCoder that you want to set up as a booster pump.
- Press the **Next** button to move to the **Use As Booster Pump** field, and then press the **+** button change the setting to **Yes**.
- Press the **Next** button to move to the **Select Programs with Booster Pumps** field, and then press the **+** button to select the program that you want to assign the booster pump to.
- When you have finished making changes, turn the dial to the **RUN** position.

Booster Pumps	Water Sources
biCoder: D003329 {MV1}	MV1
Use As Booster Pump	Yes
Select Programs with Booster Pumps	- -
{Program 1}	1 Yes
	2 No
	3 No
Booster Pump: MV1 / D003329	
Help	

Assigning Water Sources to Mainlines

The BaseStation 3200 supports 8 points of connection (water sources) and 8 mainlines. By default, the mainlines are numbered in the controller from 1 – 8 regardless of whether your system has more than one. All water sources are automatically assigned to mainline #1, but you can change the settings to match your irrigation system’s watering topology. The following diagram illustrates the model that the controller uses to manage these connections.



- Turn the dial to the **Flow** position.
- Press the **Next** button to highlight the **Assign Water Sources to Mainlines** option.
- Press the **Enter** button. The POC to Mainline screen displays.
- In the **Point of Connection** column, press the **+** or **-** button to highlight the POC that you want to assign to a mainline.
- Press the **Next** button to move to the **Mainline** column, and then press the **+** or **-** button to highlight the mainline that you want to assign to that POC.
- Press the **Previous** button to return to the **Point of Connection** column.
- Repeat steps 4 - 6 until you have assigned all POCs to the corresponding mainlines.

POC to Mainline	Flow
Point of Connection	Mainline
POC-1	ML-1
POC-2	ML-2
POC-3	ML-3
POC-4	ML-4
POC-5	ML-1
POC-6	ML-1
POC3: Flow/None, MV/None	
Help	

Assigning Programs to Mainlines

The BaseStation 3200 supports 99 programs and 8 mainlines. By default, the mainlines are numbered in the controller from 1 – 8 regardless of whether your system has more than one. All programs are automatically assigned to mainline #1, but you can change the settings to match your irrigation system.

1. Turn the dial to the **Flow** position.
2. Press the **Next** button to highlight the **Assign Programs to Mainlines** option.
3. Press the **Enter** button. The Progs to Mainline screen displays.
4. In the **Program** column, press the + or – button to highlight the program that you want to assign to a mainline.
5. Press the **Next** button to move to the **Mainline** column, and then press the + or – button to highlight the mainline that you want to assign to that program.
6. Press the **Previous** button to return to the **Program** column.
7. Repeat steps 4 - 6 until you have assigned all programs to the corresponding mainlines.

Progs to Mainline		Flow	
Program		Mainline	
-		-	
-		-	
PG-1		ML-1	
PG-2		ML-2	
PG-3		ML-3	
PG-4		ML-4	

Setting Up the Mainline Operating Limits

The mainline is the primary water management feature in your irrigation system. In the BaseStation 3200, you can configure the following settings for the mainline in order to better manage flow in your irrigation system.

Note: The step-by-step procedure for setting up the mainline is on page 76.

- **Design Flow GPM** – This field is the flow rating for the mainline in gallons per minute (GPM). This flow is likely different from the design flow of the POC/flow device. When a mainline has multiple POCs with different capacities, the controller uses the constrained design flow to determine the actual available flow for watering.

For example, consider the following design flows:

Flow Device #1 = 50 GPM

Flow Device #2 = 75 GPM

Mainline #1 = 100 GPM

In the example, the controller would use 100 GPM for managing zone concurrency unless flow device #2 was shut off (over budget or lower priority). In this case, the controller would use 50 GPM.

- **Pipe Fill Time** – This field represents the time that it takes to fill the pipe and achieve a steady flow rate after a valve change. The default value is 2 minutes, but you can set it to any value between 1 and 30 minutes. Zone changes are made at the top of the minute, and the zone is considered stable after the pipe fill time. One minute after the pipe fill time, a valid flow is calculated (over the last minute interval).
- **Concurrent Zones by Flow** – When you set up the design flow for the mainline and then set this field to YES, the controller will use the design flow of the individual zones (or learned flow) and will turn on zones that are waiting to water until their design flow is equal to or less than the available flow on the mainline.

For example, with 100 GPM available, the system can run three zones at 30 GPM and a fourth at 10 GPM at one time – later there may be two zones at 30 GPM and one at 20 GPM (the system cannot always hit 100 GPM exactly).

- **Flow Variance Settings**

- **High Flow Variance Alarm** – You can set the high variance limit to Off or to any value between 1% and 100%. 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 or lower than the expected flow. When the ratio becomes greater than the variance, then an alarm is generated. For example, if the expected flow is 50 GPM, and the High Alarm variance is 10%, then the acceptable flow range is up to 55 GPM.
- **High Flow Shutdown** – Set this field to Y (yes) to have the system shut down when the high variance exceeds the limits. A high alarm prompts the system to determine the zone (or set of zones) that is causing the high flow variance. The currently running zones are marked as “suspects” and are shut off. The program continues to water with another set of zones and one of the suspect zones. If the variance is within limits, the zone will be marked as good and watering will continue. If the variance is out of limit, then the zone will be marked as a failure and shut down. This method allows watering to continue almost without interruption, while isolating the faulty zone or zones.
- **Low Flow Variance Alarm** – You can set the low variance limit to Off or from 1% to 100%. 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 or lower than the expected flow. When the ratio becomes greater than the variance, then an alarm is generated. For example, if the expected flow is 50 GPM, and the Low Alarm variance is 10%, then the acceptable flow range is down to 45 GPM.
- **Low Flow Shutdown** – Set this field to Y (yes) to have the system shut down when the low variance exceeds the limits. A low alarm prompts the system to determine the zone (or set of zones) that is causing the low flow variance. The currently running zones are marked as “suspects” and are shut off. The program continues to water with another set of zones and one of the suspect zones. If the variance is within limits, the zone will be marked as good and watering will continue. If the variance is out of limit, then the zone will be marked as a failure and shut down. This method allows watering to continue almost without interruption, while isolating the faulty zone or zones.

To set up the mainline

1. Turn the dial to the **Flow** position.
2. Press the **Next** button to highlight the **Setup Mainline Operating Limits** option.
3. Press the **Enter** button. The Setup Mainline screen displays.

Setup Mainline	Flow
Mainline	<input type="text" value="ML-1"/>
Design Flow (GPM)	<input type="text" value="50.0"/>
Pipe Fill/Stabilize (min)	<input type="text" value="5"/>
Concurrent Zones by Flow	<input type="text" value="YES"/> <input type="text" value="Shut down"/>
High Flow Variance (Alarm)	<input type="text" value="35%"/> <input type="text" value="Y"/>
Low Flow Variance (Alarm)	<input type="text" value="20%"/> <input type="text" value="Y"/>
<input type="button" value="Help"/>	

4. In the **Mainline** field, press the + or – button to select the number of the mainline that you want to set up.
5. Press the **Next** button to go to the **Design Flow (GPM)** field, and then press the + button to enter the amount of flow in gallons per minute (GPM) that is allowed through the mainline for the irrigation system.

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

6. Press the **Next** button to go to the **Pipe Fill/Stabilize** field, and then press the + button to enter the amount of time in minutes that it takes to fill the pipe and achieve a steady flow rate after a valve change.
7. Press the **Next** button to go to the **Concurrent Zones by Flow** field. If you want the controller to use the mainline design flow to determine how many zones can run concurrently, press the + button to enter **YES**.
8. Press the **Next** button to go to the **High Flow Variance (Alarm)** field. If you want to set an alarm for a high flow variance condition, press the + button to enter a percentage in the field.

Example: If the expected flow is 50 GPM, and the High Alarm field is set to 35%, then the acceptable flow range is up to 67.5 GPM (35% of 50 GPM is 17.5 GPM). A flow amount over 67.5 GPM would trigger the high flow variance alarm.

9. Press the **Next** button to go to the **High Flow Shutdown** field. If you want the system to shut down when a high flow is detected, press the + button to enter **Y** (yes).
10. Press the **Next** button to go to the **Low Flow Variance (Alarm)** field. If you want to set an alarm for a low flow variance condition, press the + button to enter a percentage in the field.

Example: If the expected flow is 50 GPM, and the Low Alarm field is set to 20%, then the flow can decrease to 40 GPM (20% of 50 GPM is 10 GPM). A flow amount below 40 GPM would trigger the low flow variance alarm.

11. Press the **Next** button to go to the **Low Flow Shutdown** field. If you want the system to shut down when a low flow is detected, press the + button to enter **Y** (yes).
12. When you have finished making changes, turn the dial to the **RUN** position.

Learning Flow

With one or more flow devices, the BaseStation 3200 has the ability to do a learn flow cycle to determine the flow for zones. You can run the learn flow cycle either for individual zones or by program. You can set up the learn flow cycle to be delayed from 15 minutes to 23 hours and 45 minutes. You can set multiple programs to learn the flow, each at a different time, or the same time. When you schedule a learn flow cycle, it only runs one time.

Learning the Flow by Zone

For each zone, you can either set the design flow manually, or you can configure it to run through 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.

1. Turn the dial to the **Flow** position.
2. Press the **Next** button to highlight the **Zone Learn Flow Operations** option.
3. Press the **Enter** button. The Zone Learn Flow screen displays.
4. In the **Zone** field, press the + button to select the zone that you want to schedule a learn flow cycle for.
5. Press the **Next** button to go to the **Status** field. If the system already ran a learn flow cycle for this zone, the status of that cycle (complete or failed) displays in the field. To schedule a learn flow cycle, press the + button to advance the delay time by 5 minutes.
6. When you have finished scheduling the learn flow cycle, turn the dial to the **RUN** position.

Zone Learn Flow		Flow
Zone	Status	Date
-	-	-
-	-	-
1	Scheduled	10/14/14 12:28PM
2	Not Yet	-
3	Not Yet	-
-	-	-

{Zone 1}

Help

IMPORTANT NOTE! The learn flow cycle does not start until you turn the dial to the RUN position.

When the learn flow cycle completes, the value is displayed in the Flow field on the Zone Setup screen for the specific zone.

Learning the Flow by Program

1. Turn the dial to the **Flow** position.
2. Press the **Next** button to highlight the **Program Learn Flow Operations** option.
3. Press the **Enter** button. The Prog Learn Flow screen displays.
4. In the **Program** column, press the + button to move to the program that you want to schedule a learn flow cycle for.
5. Press the **Next** button to move to the **Status** column, and then press the + button to toggle the setting between Pending and Not Yet.
6. Press the **Next** button to move to the **Date** column, and then press the + button set the learn time in 5 minute increments in the future, up to about 24 hours.

Prog Learn Flow		Flow
Program	Status	Date
-	-	-
-	-	-
PG-1	Pending	6/6/12 1:34PM
PG-2	Not Yet	Not Yet
PG-3	na	Not Yet
PG-4	na	Not Yet
Prog Zones: 1,2,3,4,5...		
		<input type="button" value="Help"/>

Note: At the 24 hour point the status will return to Not Yet.

7. When you have finished setting up the learn flow cycle, turn the dial to the **RUN** position.

IMPORTANT NOTE! The learn flow cycle does not start until you turn the dial to the RUN position. Depending on how many zones a program has, the learn flow cycle could take more than an hour to complete.

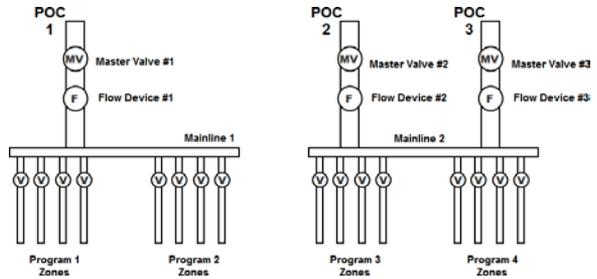
When the learn flow cycle begins, it will pause any running programs (on that mainline), and it will run one zone at a time to learn its flow. The controller takes an average of multiple readings. If the readings vary too much, the learn flow process will fail. When the learn flow cycle completes, the value is displayed in the Flow field on the Zone Setup screen for each zone.

Managing Multiple Flow Devices and Mainlines

With the BaseStation 3200, you can independently manage 8 mainlines separate from each other. A mainline is defined as a primary water delivery pipe that delivers water to a specific set of zones (valves and heads). Mainlines are considered to be different and separate if the water in one mainline cannot be delivered to the zones of another mainline.

You can program sites with this topology so that each mainline operates independently. In this scenario, a learn flow cycle can be running on mainline 1, while a high flow shutdown event is occurring on mainline 2, but the other mainlines and their programs/zones will continue to operate normally.

If you want your irrigation system to have this capability, you need to assign the various pieces of your system to a corresponding mainline. A mainline can have flow devices, master valves, and programs (which contain the zones connected to the mainline). The illustration to the right shows how you can configure a site that has two mainlines. Note that mainline 2 has two POCs, each with a master valve and flow device.



You will find it helpful to have a diagram of your site when you are configuring the BaseStation 3200.

Most sites are served by a single mainline, meaning that all water is distributed through a single pipe, even though there may be multiple POCs that supply water to that pipe or mainline. For this reason, mainline 1 is the default for all flow devices, master valves, and programs.

8 – Manual Operations

The BaseStation 3200 has several options that enable you to manually control your irrigation system. You can force a program to start, stop a program that is actively watering or set the next start date for a program.

You can also manually water a single zone, all zones, or the zones of a program, and you can manually run a pump or a master valve. The Manual 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.

Forcing a Program to Start

When you use this option to start a program, the zones water according to the program including water times, soak times, and sensor conditions.

If you want to manually run the zones in a program for a specified amount of time, refer to Manually Running Programs for a Fixed Time on page 84.

1. Turn the dial to the **Manual** position.
2. Press the **Next** button to highlight the **Start or Stop Program(s)** option.
3. Press the **Enter** button. The Prog Start/Stop screen displays.
4. In the **Program/Status** column, press the **+** button to highlight an idle or paused program that you want to start.

Note: The zones in the selected program display under the Program/Status column and any conditions that affect the manual run also display.

5. Press the **Next** button to move to the **Start/Stop** column. The field in this column displays **Start**.
6. Press the **+** button. The field in the Start/Stop column displays **Stop**, and the program's status changes to **Watering**.
7. To start the manual run, turn the dial to the **RUN** position.

Prog Start/Stop		Manual
Program/Status		Start/Stop
-	-	-
1	Watering	Stop
2	Idle	Start
3	Idle	Start
4	Idle	Start
5	Idle	Start
Prog 2 Zones: 5,6,7,8		
*** Active Pause: Water Window ***		
Turn Dial to RUN to Start		Help

Stopping an Active Program

1. Turn the dial to the **Manual** position.
2. Press the **Next** button to highlight the **Start or Stop Program(s)** option.
3. Press the **Enter** button. The Prog Start/Stop screen displays.
4. In the **Program/Status** column, press the + button to highlight a watering program that you want to stop.
5. Press the **Next** button to move to the **Start/Stop** column. The field in this column displays **Stop**.
6. Press the + button. The field in the Start/Stop column displays **Start**, and the program's status changes to **Idle**.
7. Turn the dial to the **RUN** position.

Prog Start/Stop		Manual
Program/Status		Start/Stop
-	-	-
-	-	-
1	Watering	Stop
2	Idle	Start
3	Idle	Start
4	Idle	Start
Prog 1 Zones: 1,2,3,4,5...		
Turn Dial to RUN to Start		Help

Manually Starting/Stopping the Zones of a Program

You can manually run one or more zones of a program for their programmed water times. You can also use this option to stop one or more zones of a program that is currently running.

Example: After zones 1 – 3 of program 1 ran, you had to stop watering. Later, you manually start program 1 again, and you can use this option to set zones 1 – 3 to done because they ran earlier.

1. Turn the dial to the **Manual** position.
2. Press the **Next** button to highlight the **Start or Stop Program Zone(s)** option.
3. Press the **Enter** button. The Zone Start/Stop screen displays.
4. In the **Prog** column, press the + button to highlight the program that has the zones that you want to run.
5. Press the **Next** button to move to the **Zone/Status** column.
6. Press the + button to highlight the zone that you want to run.
7. Press the **Next** button to move to the **Start/Stop** column. The field in this column displays **Start**.
8. Press the + button. The field in the Start/Stop column displays **Stop**, and the program's status changes to **Watering**.

Zone Start/Stop		Manual
Prog	Zone/Status	Start/Stop
-	-	-
-	-	-
1	1 Sprinkling	Stop
2	2 Done	Start
3	3 Done	Start
4	4 Done	Start
Prog 1 Zones: 1,2,3,4,5...		
Turn Dial to RUN to Start		Help

9. If you want to manually run another zone in the program, press the **Previous** button to return to the **Zone/Status** column. Repeat steps 6 – 8 to start another zone.
10. To start the manual run, turn the dial to the **RUN** position.

Manually Running One or All Zones for a Fixed Time

1. Turn the dial to the **Manual** position.
2. If the **Run One or All Zones for Fixed Time** option is highlighted, press the **Enter** button. If the option is not highlighted, press the **Next/Previous** button to highlight it, and then press the **Enter** button. The Manual One/All screen displays.
3. In the **Zone** column, press the **+** button to highlight **ALL** or the zone that you want to run.
4. Press the **Next** button to move to the **Run Time** field, and then press the **+** or **-** button to set the amount of time for the manual run.
5. Press the **Next** button to move to the **Initial Delay** field. If you want the controller to delay the start of the manual run to give you time to walk to the zone location, press the **+** or **-** button to set the amount of time for the delay.
6. Press the **Next** button to move to the **Between Zone Delay** field. If you chose **ALL** in the Zone column, you can use this field to set a delay between each zone. Press the **+** or **-** button to set the amount of time for the delay.
7. Press the **Next** button to move to the **MV (POC)** field. Press the **+** button to select a specific master valve or point of connection (POC). You can also select **AUTO** to have the system select the MV (POC). When you select **AUTO**, the POC and MV numbers display below the field.

Note: If you want to use this option to perform a seasonal blow-out of your irrigation system, set the MV (POC) field to **OFF**.

8. When you have finished making changes, turn the dial to the **RUN** position. When the manual run starts, the main screen shows the details.
9. If you want to stop the manual run while it is active, press the **Back** button.

Manual One/All		Manual	
Zone		h:mm:ss	
None		Run Time	0:01:00
All		Initial Delay	0:00:00
1		Between	0:00:00
2		Zone Delay	0:00:00
3		MV (POC)	Auto
4			PRG1/POC1/MV1
{Front Raised Bed}			
Turn Dial to RUN to Start			Help

5 Message(s)	RUN
{Leanne's BaseStation	Text - 243
11:16:58 AM	BaseMgr: Connected
Wed - 1/29/2014	Two-wire: 0.08 Amps
	00W0268: 0.00 GPM
Manual Run - Zone(s)	
Delay/Time Left = 0:00 / 0:00:47	
Active Zone = 1	
Valve Current/Voltage = 0.26 / 35.3	
{Front Raised Bed}	
Active MVs = MV1	
MV1 Current/Voltage = 0.01 / 24.0	
Press BACK to Stop	

Manually Running Zones for a Fixed Time

1. Turn the dial to the **Manual** position.
2. If the **Run Zone(s) for Fixed Time** option is highlighted, press the **Enter** button. If the option is not highlighted, press the **Next/Previous** button to highlight it, and then press the **Enter** button. The Manual Zones screen displays.
3. In the **Zone** column, press the **+** button to highlight the zone that you want to run.
4. Press the **Next** button to move to the **Run Time** column, and then press the **+** or **-** button to set the amount of time for the manual run.
5. If you want to add another zone to the manual run, press the **Previous** button to return to the **Zone** column, and then repeat steps 3 – 4 to set the time for the next zone.

Manual Zones		Manual	
Run Time Zone (hr:min:sec)		Run MVs	
-	-	-	-
-	-	-	-
1	0:01:00	MV1	Yes
2	Off	-	-
3	Off	-	-
4	Off	-	-
1 at a Time			
Turn Dial to RUN to Start			
			Help

6. Press the **Next** button to move to the **Concurrent Zones** field. If you want more than one zone to run at one time during the manual run, press the **+** button to change the number in this field.
7. Press the **Next** button to move to the **Run MVs** column. Press the **+** button to select Yes or No for the specific master valve.
8. When you have finished making changes, turn the dial to the **RUN** position. When the manual run starts, the main screen shows the details.
9. If you want to stop the manual run while it is active, press the **Back** button.

Note: When the manual run is complete, the controller changes the Run Zone(s) for Fixed Time settings to Off.

5 Message(s)	RUN Test - 243
{Leanne's BaseStation	
11:56:57 AM	BaseMgr: Connected
Wed - 1/29/2014	Two-wire: 0.09 Amps
	00W0268: 0.00 GPM
Manual Run - Zones	
Zone1 Time Left = 0:00:34	
Active Zone(s) = 1	
Zone1 Current/Voltage = 0.24 / 35.1	
{Front Raised Bed}	
Active MVs = MV1	
MV1 Current/Voltage = 0.01 / 24.0	
Press BACK to Stop	

Manually Running Programs for a Fixed Time

1. Turn the dial to the **Manual** position.
2. Press the Next button to highlight the **Run Program(s) for Fixed Time** option.
3. Press the **Enter** button. The Manual Prog Zones screen displays.
4. In the **Prog** column, press the + button to highlight the program that you want to run.
5. Press the **Next** button to move to the **Zone Time** column, and then press the + or - button to set the amount of time for the manual run.

Manual Prog Zones		Manual
Prog	Zone Time (hr:min:sec)	Concurrent Zones
-	-	-
-	-	-
1	0:01:00	2 at a Time
2	Off	-
3	Off	-
4	Off	-

Programs to Run: 1
Turn Dial to RUN to Start Help

6. If you want to add another program to the manual run, press the **Previous** button to return to the **Prog** column, and then repeat steps 4 – 5 to set the time for the next zone.
7. Press the **Next** button to move to the **Concurrent Zones** column. If you want more than one zone to run at one time during the manual run, press the + button to change the number in this field.
8. When you have finished making changes, turn the dial to the **RUN** position. When the manual run starts, the main screen shows the details.
9. If you want to stop the manual run while it is active, press the **Back** button.

Note: When the manual run is complete, the controller changes the Run Program(s) for Fixed Time settings to Off.

5 Message(s)	RUN
{Leanne's BaseStation	Test - 243
12:02:50 PM	BaseMgr: Connected
Wed - 1/29/2014	Two-wire: 0.15 Amps
	00W0268: 0.00 GPM
Manual Run - Program Zones	
Zone1 Time Left = 0:00:46	
Active Zone(s) = 1, 2	
Zone1 Current/Voltage = 0.26 / 35.3	
{Front Raised Bed}	
Active MVs = MV1	
MV1 Current/Voltage = 0.01 / 24.0	
<i>Press BACK to Stop</i>	

Manually Running a Pump or MV for a Fixed Time

If you want to get water to a hose bib that is attached to a master valve, you can use this option to manually turn on the MV for a specified amount of time. You can also use this option when you want to test all your lines.

1. Turn the dial to the **Manual** position.
2. Press the Next button to highlight the **Run Pump or MV for Fixed Time** option.
3. Press the **Enter** button. The Manual Pump/MV screen displays.

Manual Pump/MVs		Manual
Pump /MV	Run Time (hr:min:sec)	Concurrent Pump/MVs
-	-	-
-	-	-
MV1	0:01:00	1 at a Time
-	-	-
-	-	-
-	-	-

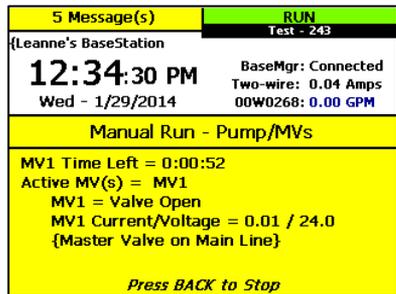
Pump/MVs to Run: MV1
Turn Dial to RUN to Start Help

4. In the **Pump/MV** column, press the **+** button to highlight the pump or master valve that you want to run.
5. Press the **Next** button to move to the **Run Time** column, and then press the **+** or **-** button to set the amount of time for the manual run.
6. If you want to add another pump or master valve to the manual run, press the **Previous** button to return to the **Pump/MV** column, and then repeat steps 4 – 5 to set the time for the next pump or master valve.
7. Press the **Next** button to move to the **Concurrent Pump/MVs** field. If you want more than one pump or master valve to run at one time during the manual run, press the **+** button to change the number in this field.

8. When you have finished making changes, turn the dial to the **RUN** position. When the manual run starts, the main screen shows the details.

9. If you want to stop the manual run while it is active, press the **Back** button.

Note: When the manual run is complete, the controller changes the Run Pump or MV for Fixed Time settings to Off.

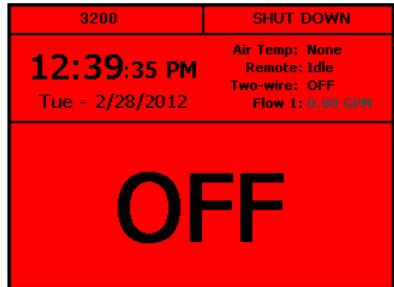


Setting the System to OFF

Turn the dial to the OFF position when you want to halt all watering for an indefinite period of time. No watering cycles will be started. Use this dial position for seasonal shutdown. DO NOT power down the BaseStation.

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

- All current watering cycles will be stopped and all zones will be set to Done.
- It will power down the two-wire (even if it has been set to always be powered up).

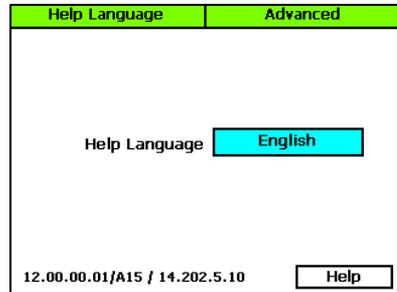


9 – System Management

The BaseStation 3200 has a number of features that enable you to manage the controller. You can select the language for the online help, set up personal identification numbers (PINs) to grant various levels of remote access to 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 with a download from the Baseline web site or from BaseManager.

Selecting the Language for Online Help

1. Turn the dial to the **Advanced** position.
2. If the **Select Language for Help Displays** option is highlighted, press the **Enter** button. If the option is not highlighted, press the **Next/Previous** button to highlight it, and then press the **Enter** button. The Help Language screen displays.
3. In the **Help Language** field, press the + button to toggle the setting between English and Spanish.
4. If you make a change to the language setting and you want to test the Online Help, press the **Next** button to highlight the **Help** field and then press the **Enter** button. The Online Help displays in the selected language. To return to the Help Language screen, press the **Back** button.



Setting Up Security for the Controller

In the BaseStation 3200, you can set up the following levels of security access:

- **Administrator:** Grants access to all controller functions
- **Programmer:** Grants access to most controller functions. On the Advanced menu, the programmer can access only the Data Management, Update Firmware, and System Settings options.
- **Operator:** Grants access to the Event Dates and Rain Delay Days in the Start, Stop, Pause menu, the Run menu, the Manual Run menu, and the Test menu. The operator can also view reports and messages.

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 until the dial is turned to RUN.

1. Turn the dial to the **Advanced** position.
2. Press the **Next** button to highlight the **Security Setup** option, and then press the **Enter** button. The Security screen displays.
3. In the **Enable Security Levels** field, press the + button to toggle between Enabled and Disabled.
4. Press the **Next** button to highlight the first digit of the Admin PIN, and then press the + or – button to change the number.
5. Press the **Next** 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 **Next** button to highlight the next PIN, and then repeat steps 4 and 5 until you have configured all of the PINs.

Note: Be sure to remember which PIN is associated with which access level so you are certain to give the correct PIN to the correct users.

7. When you have finished making changes, return the dial to the **RUN** position.

Setting the Two-Wire to Always On

In its default condition, the controller powers down the two-wire after 1 minute of idle time. However, if you have a normally open master valve that is not connected to a separate power source or you have a coach's button that can be used at any time, you should set the two-wire to be always on.

Additionally, if you are using a testing device to troubleshoot an issue with the two-wire, you should set the two-wire to be always on.

1. Turn the dial to the **Advanced** position.
2. Press the **Next** button to highlight the **Two-wire Settings** option, and then press the **Enter** button. The Two-wire Settings screen displays.
3. In the **Two-wire Always On** field, press the + or – button to toggle between **YES** and **NO**.

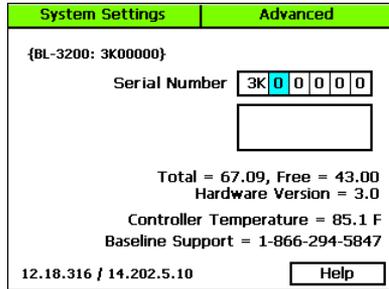
Changing the Serial Number of Your Controller

The System Settings option under the Advanced dial position allows you to change the serial number of your controller. It also provides a set of system functions that you should only perform under direction from Baseline Support.

WARNING! Only change the serial number of your controller when directed to do so by Baseline Support. If you change the serial number, you will disable your ability to restore your system from a previous backup.

Also be aware that it is easy to inadvertently change the serial number when you are in this screen. We recommend that you avoid accessing this screen unless you are directed to do so by Baseline Support.

1. Turn the dial to the **Advanced** position.
2. Press the **Next** button to highlight the **System Settings** option, and then press the **Enter** button. The System Settings screen displays.
3. Press the + or – button to change the number in the first digit of the serial number.
4. Press **Next** button to highlight the next digit of the serial number, and then press the + or – button to change the number. Repeat this step to change the numbers in all digits.
5. Perform one of the following options:
 - To save the changes to the serial number, press the **Enter** button.
 - To exit the screen without making a change, press the **Back** button.



Using the USB Data Functions

The BaseStation 3200 has a USB port that is used for transferring data and program information. For your convenience, a USB drive is affixed to the inside bottom of the BaseStation enclosure.

Note: Use a standard USB drive for these functions. A multi-function USB memory device such as an MP3 player is not compatible with these functions.

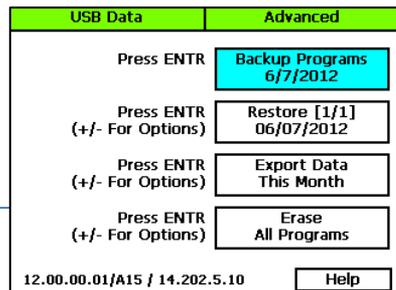
Backing Up Your System

After you have created a stable program on your controller, you should create a backup of your program data. Likewise, if you make any programming changes, be sure to create a new backup to capture those changes. You should also create a backup before you do a firmware update on your controller. The backup will allow you to restore to the previous programming if anything goes wrong.

1. Turn the dial to the **Advanced** position.
2. Plug a USB drive into the USB port on the faceplate of the controller.

WARNING! To avoid damaging the connector pins, gently push the drive into the port.

3. Press the **Next** button to move to the **Data Management (USB Storage)** option, and then press the **Enter** button. The USB Data screen displays.



- When the **Backup** option is highlighted, press the **Enter** button. The controller writes a copy of the current programming to the USB drive. The data is saved in a folder that is the same as the serial number of the controller (such as 3K0001). When the controller finishes copying the data to the USB drive, notice that the backup date is listed as an available restore point within the Restore option box.
- Unplug the drive from the port, and then turn the dial back to the **RUN** position.

Note: You can leave the backup data on the USB drive until you need it for a restore.

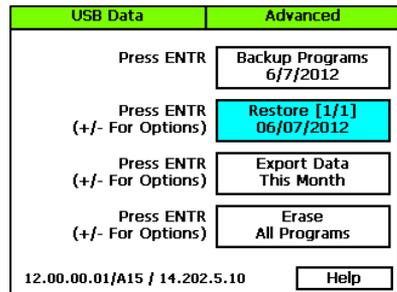
However, if you need the USB drive for another purpose, you can also copy the data to a computer. Just make sure that you maintain the same folder structure, folder names, and filenames, so you can copy it back to the USB drive if you need to use it to restore your data.

Restoring Your System

If your controller has lost its programming data, you can restore it from a backup that you previously made.

- Plug the USB drive that has the backup data on it into the USB port on the faceplate of the controller.
- Turn the dial to the **Advanced** position.

- Press the **Next** button to move to the **Data Management (USB Storage)** option, and then press the **Enter** button. The USB Data screen displays. When the controller finds the backup data on the USB drive, the backup date is listed as an available restore point within the Restore option box.



- Press the **Next** button to highlight the **Restore** option, and then press the **Enter** button. The controller replaces the current programming with the copy from the USB drive.

Note: If a USB drive has multiple backup files

for this controller, the number of files is indicated inside the brackets within the Restore option box. For example, [1/3] means that the USB drive has 3 backup files and you have selected the first of those 3 files with the date that displays in the box. If you want to use a different backup file for the restore, press the + or – button to display a different file number and date.

- When the controller finishes copying the data from the USB drive, unplug the drive from the port, and then turn the dial back to the **RUN** position.

Exporting Log Files

The BaseStation 3200 saves up to two years of log files. The controller records all programming changes, water times, moisture levels, and other internal information in these files. The daily files are saved in folders by month. When you perform an export, all of the files are copied to the USB drive in the controller serial number folder, and in a subfolder called Export.

Note: These files may be requested by Baseline Support.

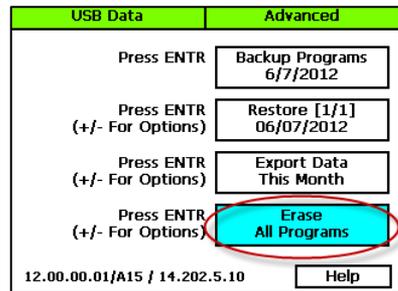
1. Plug a USB drive into the USB port on the faceplate of the controller.
WARNING! To avoid damaging the connector pins, gently push the drive into the port.
2. Turn the dial to the **Advanced** position.
3. Press the **Next** button to move to the **Data Management (USB Storage)** option, and then press the **Enter** button. The USB Data screen displays.
4. Press the **Next** button to move to the **Export Data** option.
5. Press the **+ or –** button to select the range of data that you want to export:
 - This Month
 - Last Month
 - Everything
6. Press the **Enter** button. The controller copies the internal log files to the USB drive.
7. After the controller has finished copying the log files to the USB drive, unplug the drive from the port, and then turn the dial back to the **RUN** position.

Erasing All Programming from the Controller

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

IMPORTANT NOTE! Never erase your programming data without having a current backup available for a restore. Refer to Backing Up Your System on page 88.

1. Turn the dial to the **Advanced** position.
2. Press the **Next** button to move to the **Data Management (USB Storage)** option, and then press the **Enter** button. The USB Data screen displays.
3. Press the **Next** button highlight the last option box on the screen.
4. Press the **+ or –** button to set the option in the box to **Erase All Programs**.



Note: The other option in this box is Erase All Files.

WARNING! Do not perform the next step unless you are certain that you want to erase your programming data – this option DOES NOT allow you to cancel the procedure after you press the Enter button.

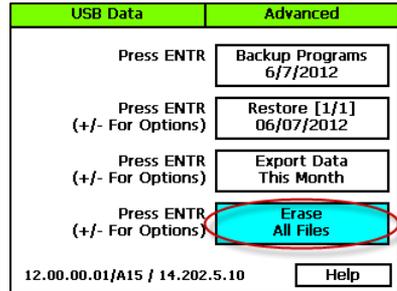
5. Press the **Enter** button to erase the programs.

Erasing All Files from the Controller

This function will clear or erase all log files from the controller. We recommend that you use this function only when directed by Baseline Support.

1. Turn the dial to the **Advanced** position.
2. Press the **Next** button to move to the **Data Management (USB Storage)** option, and then press the **Enter** button. The USB Data screen displays.
3. Press the **Next** button highlight the last option box on the screen.
4. Press the + or – button to set the option in the box to **Erase All Files**.

Note: The other option in this box is Erase All Programs.



WARNING! Do not perform the next step unless you are certain that you want to erase your files – this option DOES NOT allow you to cancel the procedure after you press the Enter button.

5. Press the **Enter** button to erase the files.

Updating the Controller Firmware

Firmware updates are free for the life of any Baseline controller as long as the hardware is compatible. Baseline will periodically release firmware updates 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 Your System on page 88.

To update the controller's firmware from the Baseline web site with a USB drive

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

1. Download the firmware from the Baseline web site.
 - a. On a computer that is connected to the Internet, go to the Baseline web site at the following URL:
www.baselinesystems.com
 - b. On the home page, click **Support**.
 - c. In the left navigation bar, click **Firmware Version Updates**.
 - d. Click the tab for your product.
 - e. Click the button to download the firmware upgrade.
 - f. When prompted, choose the **Save As** option. The Save As dialog box displays.
 - g. When the download is complete, open Windows Explorer and navigate to the Download directory.
 - h. Find the .zip file, and then double-click the file to unzip it. The Update folder will display in the Download directory.
 - i. Plug the USB drive into a USB port on your computer.
 - j. When Windows prompts, click the option to open the folder and view the files. A Windows Explorer window will open and display the contents of the USB drive.
 - k. In another Windows Explorer window, find the Update folder in your Download directory.
 - l. Right-click on the Update folder, and then click **Copy**.
 - m. Go to the Windows Explorer window for the USB drive.
 - n. Right-click in the file pane, and then click **Paste**. The Update folder (along with its contents) is copied to the USB drive. The Update folder should be at the root of the USB drive.
 - o. Close the Windows Explorer window for the USB drive.
 - p. In the System Tray area of your Windows Desktop, click the option to **Safely Remove Hardware and Eject Media**.
 - q. 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 3200 controller, plug the USB drive that has the Update files on it into the USB port.
 - b. Turn the dial to the **OFF** position.
 - c. Press and hold the – and + and **Enter** buttons for approximately 5 seconds.
 - d. After the screen goes blank, release the buttons. The controller restarts automatically.
 - e. Unplug the USB drive from the port on the controller.

Note: If the firmware did not update as expected, please call Baseline Support at 866.294.5847.

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 Connecting to BaseManager on page 94.
2. Turn the dial to the **Advanced** position.
3. Press the **Next** button to highlight the **Update Firmware (BaseManager)** option, and then press the **Enter** button to select it. If an update is available from BaseManager, the controller displays the information on the screen.
4. The **Update** option is highlighted in the lower-right corner of the screen. Press the **Enter** button to start the firmware update.

The controller will be locked while the update is being applied. When the update is complete, the controller restarts and briefly displays the new firmware version.

Note: If the firmware did not update as expected, please call Baseline Support at 866.294.5847.

Connecting to BaseManager – Overview

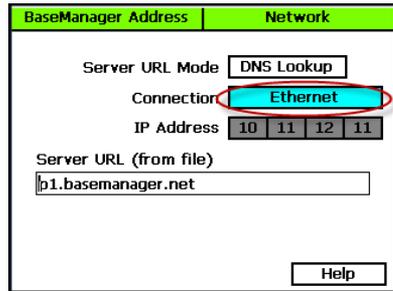
BaseManager is Baseline's central control solution, which gives you remote access to your BaseStation 3200. In order to use BaseManager, your controller needs to be connected to a network with a supported communication module such as built-in Ethernet, Wi-Fi, Ethernet radio, or cell modem. You also need access to a BaseManager server – either Baseline's server or your organization's server.

- **Connecting to Baseline's BaseManager Server:** The BaseStation 3200 is preconfigured to connect to Baseline's BaseManager server. After you connect your controller to the network using a supported communication module, you can check the status of your connection on the RUN screen.

- **Connecting to Your Organization’s BaseManager Server:** Get the IP address of that server from your network administrator, and then configure the BaseStation 3200 to connect to that server with a static IP address. Refer to Connecting Your Controller to a Self-hosted BaseManager Server in the BaseManager Quick Start Guide.

Enabling the BaseManager Connection on the Controller

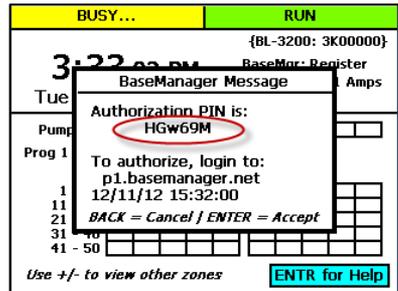
1. Turn the dial to the **Network** position.
2. Press the **Next** button to highlight the **BaseManager Server Setup** option, and then press **Enter**. The BaseManager Address screen displays.
3. Press the **Next** button to highlight the **Connection** field, and then press the + or – button to choose one of the following settings:
 - **Ethernet** – Enables the BaseManager connection
 - **Don’t Connect** – Disables the BaseManager connection



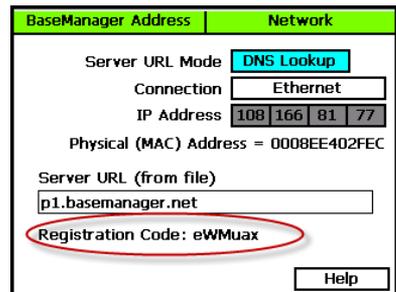
Checking the Status of the BaseManager Connection

When your controller connects to the BaseManager server for the first time, the server detects the connection and checks for an associated BaseManager account. If no account is found, the server sends a registration code to your controller. The PIN briefly displays in a pop-up message as shown in the illustration. You need the PIN when you call Baseline to set up your BaseManager account. You also need the PIN to add a controller to an existing BaseManager account.

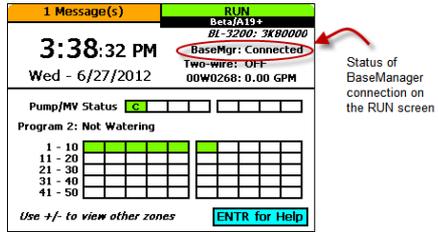
After the message is dismissed from the display, you can find the PIN on the BaseManager Address screen.



1. Turn the dial on the BaseStation 3200 controller to **Network**.
2. When the **BaseManager Server Setup** option is highlighted, press the **Enter** button to select it. The BaseManager Address screen displays as shown in the lower illustration.
3. Write down the PIN found in the **Registration Code** field on this screen.
4. Write down the MAC address of the BaseStation 3200 controller found in the **Physical (MAC) Address** field on this screen.



Check the status of your network connection by turning the controller’s dial to the **RUN** position and viewing the status in the **BaseMgr** field.



Activating Your BaseManager Account

When you are ready to activate your BaseManager account, call Baseline Support at 866-294-5847.

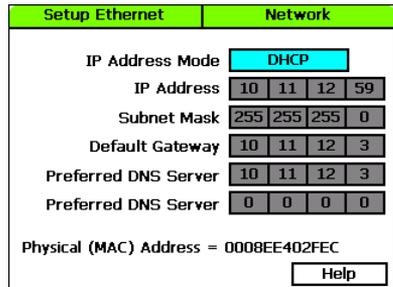
Baseline Support will assign the company admin username and password. The admin can change this password after logging in for the first time.

If you already have a BaseManager account and you are just connecting a new controller to BaseManager, you don’t need to set up another account. Just be sure to write down the authorization PIN that displays on your controller when it’s connected. Then you will use that PIN to add the controller to your existing BaseManager account. Refer to the Adding Controllers topic in the BaseManager Help.

Setting Up the Default Network Connection

By default the controller uses the Dynamic Host Configuration Protocol (DHCP) to have the IP address automatically set by the network.

1. Connect and configure the communication module. Check the status lights and indicators on your communication equipment to ensure that it is powered up and appears to be sending and receiving data.
2. On the controller, turn the dial to the **Network** position.
3. Press the **Next** button to highlight the **Ethernet Setup** option, and then press **Enter**. The Setup Ethernet screen displays.
4. Make sure that **DHCP** displays in the **IP Address Mode** field. If it does not, press the + or – button to change the value to **DHCP**.



Note: For a definition of the fields on the Setup Ethernet screen, refer to Understanding the Ethernet Settings on page 98.

Setting Up a Static IP Address

While DHCP (Dynamic Host Configuration Protocol) is the default network configuration for the BaseStation 3200 network connection, some situations, such as private network configurations or network security issues might require that you configure a static IP address for your controller.

1. Connect and configure the communication module. Check the status lights and indicators on your communication equipment to ensure that it is powered up and appears to be sending and receiving data.
2. Turn the dial to the **Network** position.
3. Press the **Next** button to highlight the **Ethernet Setup** option, and then press **Enter**. The Setup Ethernet screen displays.
4. In the **IP Address Mode** field, press the **+** or **-** button to change the value to **Static IP**.

Note: Ask your network administrator for the settings. For a definition of the fields on the Setup Ethernet screen, refer to Understanding the Ethernet Settings on page 98.

5. Press the **Next** button to highlight the first digits in the **IP Addr** field.
 - Press the **Previous** or **Next** 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.

6. Press the **Next** button to move to the other fields that you need to change. Use the procedure described in step 5 to move within the digits and change the values.
7. To view the status of your network connection, turn the dial to the **RUN** position, and view the status in the **BaseMgr** field.

Setup Ethernet	Network
IP Address Mode	Static IP
IP Address	0 0 0 0
Subnet Mask	0 0 0 0
Default Gateway	0 0 0 0
Preferred DNS Server	0 0 0 0
Preferred DNS Server	0 0 0 0
Physical (MAC) Address = 0008EE402FEC	
Help	

1 Message(s)		RUN	
		Beta/A19+	
		BL-3200: 3K80000	
3:38:32 PM		BaseMgr: Connected	
Wed - 6/27/2012		Two-wire: OFF	
		00W0268: 0.00 GPM	
Pump/MV Status <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Program 2: Not Watering			
1 - 10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 - 20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 - 30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31 - 40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41 - 50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use +/- to view other zones			
ENTR for Help			

Status of BaseManager connection on the RUN screen

Understanding the Ethernet Settings

When your controller is connected to a network with a supported communication module, the system automatically assigns the networking addresses that enable the connection. You might need to refer to this information in order to complete your connection or to troubleshoot it.

1. Connect and configure the communication module. Check the status lights and indicators on your communication equipment to ensure that it is powered up and appears to be sending and receiving data.

2. Turn the dial to the **Network** position.

3. Press the **Next** button to highlight the **Ethernet Setup** option, and then press **Enter**. The Setup Ethernet screen displays the following information:

Setup Ethernet	Network
IP Address Mode	DHCP
IP Address	10 11 12 59
Subnet Mask	255 255 255 0
Default Gateway	10 11 12 3
Preferred DNS Server	10 11 12 3
Preferred DNS Server	0 0 0 0
Physical (MAC) Address = 0008EE402FEC	
<input type="button" value="Help"/>	

- **DHCP** (Dynamic Host Configuration Protocol) – The default network configuration for the BaseStation 3200. This 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.
- **Static IP** – An IP address that is permanently assigned
- **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.
- **Subnet Mask** – The subnet mask is used with an IP address to indicate what network traffic should be permitted or denied.
- **Default Gateway** – An IP address that enables the network traffic from your controller to pass through to a larger network
- **Preferred DNS Server 1** – A naming system (Domain Name System) for devices, such as your controller, that are connected to the Internet
- **Preferred DNS Server 2** – An additional domain name that is assigned to your controller
- **Physical (MAC) Address** – The Media Access Control address (MAC address) is a unique identifier for your controller’s network connection

Enabling a Cell Modem Connection

If your BaseStation 3200 is running firmware version 12.4 or higher and you have a cell modem installed and connected to the controller, the Cellular Modem Setup option on the Advanced menu shows the status of the connection.

Refer to the Baseline 3G Cell Modem Installation and User Guide. You should have received a copy of this document with your equipment, but you can also find it on the Baseline web site (www.baselinesystems.com).

Connecting to a FlowStation

Baseline's FlowStation is a powerful shared flow controller that allows multiple BaseStation 3200 controllers to share water resources, including master valves, pumps, and flow meters.

In a shared flow group, the FlowStation and the BaseStation 3200s communicate over an IP-based network. The FlowStation requires a static IP address on the network, and each BaseStation 3200 will need to have an IP address on the network. The BaseStation 3200's IP address can be either a static IP address or one assigned by DHCP.

Where an existing network is not available, a radio network can be set up using Baseline Ethernet radios or Wi-Fi modules.

In order to enable the shared flow features on a BaseStation 3200 controller, you must connect a Shared Flow biCoder (BL-3200UPG-SF) to the two-wire path of each controller that will be part of the shared flow group. Refer to the installation guide that came with the biCoder.

Note: Shared flow features are available in BaseStation 3200 firmware versions 12.12 and higher.

Each BaseStation 3200 is assigned to a FlowStation by programming the IP address of the FlowStation into the controller. To configure the controller for shared flow, perform the following tasks described in the FlowStation User Manual:

- Connect the BaseStation 3200 to the FlowStation (refer to Connecting a BaseStation 3200 Controller to the FlowStation)
- Turn over control of the POCs to the FlowStation (refer to Enabling Shared Flow for a POC on the BaseStation 3200)
- Assign the programs to the FlowStation (refer to Assigning Programs to the FlowStation)
- Assign the Booster Pumps to the FlowStation (refer to Assigning Booster Pumps to the FlowStation)

When the shared flow configuration is complete on the BaseStation 3200 and a start condition is met for a program that is assigned to the FlowStation, the controller asks the FlowStation for water. After the FlowStation allocates the water, the program will start.

10 – Reports, Messages, & Logs

The main screen shows basic information about the operating state of the BaseStation controller, but additional reports and messages are available from the Reports dial position and the Messages dial position. The controller provides the following categories of reports and each category can have multiple reports.

- Zone Status
- Test All
- Moisture Sensor Data
- Water Times
- Water Used and Flow
- Operator Messages

Some reports, messages, and alerts are only available when specific conditions cause them to be generated. For example, if the main screen indicates that a pause condition has occurred, you can access the Pause message by turning the dial to the Messages position.

Zone Status

When the controller dial is in the **RUN** position, the main screen displays the **Zone Status** report.

The screenshot shows the Zone Status screen with the following callouts:

- Messages are indicated here.** (Points to the '2 Message(s)' indicator)
- BUSY displays to indicate that the controller is performing watering calculations and communicating with devices.** (Points to the 'BUSY' indicator)
- The controller's current state** (Points to the 'RUN' indicator)
- Indicates the status of the BaseManager connection.** (Points to 'BaseMgr: Connected')
- Indicates the status of the two-wire.** (Points to 'Two-wire: 0.14 Amps')
- Indicates the total flow measured by the reporting device.** (Points to '00W0268: 0.00 GPM')
- The controller's time and date** (Points to '11:45:02 AM Thu - 12/18/2014')
- Status overview of master valves and programs in groups of 50 zones.** (Points to the 'Pump/MV Status' table)
- Press the Enter button to display the online help.** (Points to the 'ENTR For Help' button)

Group	1	2	3	4	5	6	7	8	9	10
1 - 10	1	2	3	4	5	6	7	8	9	10
11 - 20	1	2	3	4	5	6	7	8	9	10
21 - 30	1	2	3	4	5	6	7	8	9	10
31 - 40	1	2	3	4	5	6	7	8	9	10
41 - 50	1	2	3	4	5	6	7	8	9	10

When “BUSY” displays on the top line, the dial and buttons are locked out and will not work for a time. The busy time can be several seconds, depending on the number of devices on the two-wire and the number of calculations being done.

Next to the time and date, you see the status or state of the following items.

- **BaseMgr** – Indicates the status of the controller’s connection to BaseManager.
- **Two-wire** – Indicates the approximate current being supplied to the two-wire path. The value will vary with the size of the installation and the number of active valves. When the system is not watering, the two-wire status is OFF unless the two-wire is to be always on.
- **Flow Device** – If there is no flow meter installed, the controller shows the estimated flow (in brackets) based on the flow values that have been set for each zone. With one or more flow meters, the controller indicates the total flow measured. This value is updated once each minute, and is shown without brackets. More detail is available on the Water Used report.
- **Pump/MV Status** – Shows the status of each master valve.
- **Zone Status** – The lower section shows the current status of the zones in groups of 50 zones. Press the + or – button to move between the groups 50 zones.

Detailed Status by Program

Press the **Next** or **Previous** button on the main screen to display the detailed status by program.

Press the + or – button to cycle through the controller’s programs.

Press the **Next** or **Previous** button to return to the main screen.

The colored box on the left indicates the program status. Refer to the Status Colors topic for an explanation of the colors.

{3200 Development}		RUN Test - 321	
9:26:42 AM		BaseMgr: Connected	
Mon - 10/13/2014		Two-wire: 0.10 Amps	
		WMV0705: 19.8 GPM	
	1: {Program 1}		
	Last Start: 10/13/14 03:50		
	Last Pause:		
	Last Stop: 10/13/14 05:20		
	Total Time: 1:30		
	Est. Water: 4720.3 gallons		
	Next Start: 10/14/14 03:50		
<--Previous		ENTR for Help	Next-->

The following information is available in the fields:

Last Start: The date and time when the program was started for any condition including manual starts.

Last Pause: The date and time of the most recent pause. The pause information only shows while the pause is active; otherwise, the field is blank.

Last Stop: The date and time when the program last completed watering. When a program is watering, this field is blank.

Total Time: The amount of time in minutes between the last start and the last finish including any pause time.

Est. Water: The estimated water is the sum of the design flow values for the running zones. The number in this field increases minute by minute until the program is done.

Next Start: The estimated next start date and time for the program. In some cases, the start condition for a program makes it difficult to accurately estimate when the next start will occur. Consider the information in this field as helpful, but remember that it might not be perfectly accurate depending on the program settings.

Status Colors

The following colors display on the RUN screen to indicate the status of programs, master valves, flow meters, and zones.

	Idle (watering done)		Disabled
	Active (watering)		Paused
	Waiting to water		Off or Message (blinking)
	Soaking		Unused

Test All Report

The Test All report displays when you turn the dial to the Reports position. This report shows the status of all devices that are connected to your controller.

To scroll through the report, press the **Next** button to highlight the Scroll field, and then press the + button.

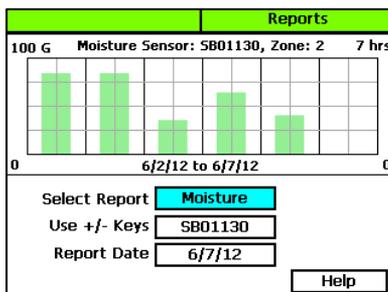
Reports	
Zone 1: E012471 Status: OK Valve Current: 0.24 Valve Voltage: 32.9 Two-wire Drop: 0.6 ----- Zone 2: E012472	
Select Report	Test All
Use +/- Keys	Scroll
Report Date	5/14/12
Help	

Moisture Sensor Data

The Soil Moisture Sensor Data report shows a moisture graph for each of the moisture sensors connected to the controller.

The graph shows the watering limits:

- Green line = lower limit – Allow watering at the next start time when the moisture has dropped below this limit
- Red line = upper limit – Stop watering during a water cycle when the moisture reaches this limit



To display the Soil Moisture Sensor Data report

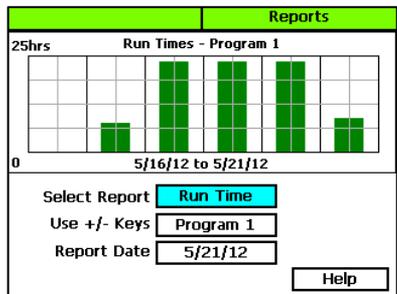
1. Turn the dial to the **Reports** position.
2. In the **Select Report** field, press the + button until **Moisture** displays in the box.
3. Perform any of the following options:
 - To view the report for a different sensor, press the **Next** button to highlight the soil moisture sensor serial number, and then press the + or – button.
 - To view the report for a different date, press the **Next** button to highlight the **Report Date** field, and then press the + or – button.

Program Run Time Report

Each program has a run time report.

Above the graph, you will see the program number that the report is generated for. Below the graph, you will see the date range for the report.

1. Turn the dial to the **Reports** position.
2. In the **Select Report** field, press the + button until **Run Time** displays in the box. The report displays for Program 1.
3. Perform any of the following options:
 - To view the report for a different program, press the **Next** button to highlight the program number field, and then press the + or – button to change the program number.
 - To view the report for a different date, press the **Next** button to highlight the Report Date field, and then press the – button to change the date.



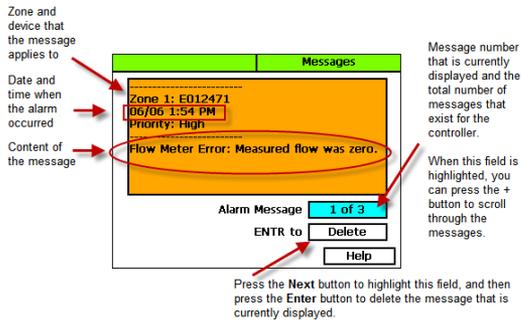
Water Used

The Water Used report displays a bar chart for each flow meter.

1. Turn the dial to the **Reports** position.
2. In the **Select Report** field, press the + button until **Water Used** displays in the box. If you have a flow meter installed, the report displays for that meter.
3. Perform any of the following options:
 - To view the report for a different flow meter, press the **Next** button to highlight the serial number field, and then press the + or – button to change the serial number.
 - To view the report for a different date, press the **Next** button to highlight the Report Date field, and then press the – button to change the date.

Operator Messages

Operator messages are used to indicate programming errors and to provide assistance in fixing common installation and operation problems. Messages can include status or warning messages, or serious controller alarms. The message shows the time and date of the alert. The message also includes suggestions for correcting the issue.



To display the messages

1. When the main screen indicates that messages exist, turn the dial to the **Messages** position.
2. If there are multiple messages, press the **+** or **-** button to scroll through the messages.
3. To clear the message, press the **Next** button to highlight the **Delete** field, and then press the **Enter** button.

Pause Messages

A variety of conditions will cause the controller to pause watering, either by specific programs or the entire controller. When one or more pause conditions occur, the Pause Condition reports describe the reasons for the pause conditions.

The following pause conditions can occur on the BaseStation 3200.

BL-Commander (handheld radio)	<ul style="list-style-type: none"> All programs will be paused while running a zone using the remote handheld radio – all programs resume when the zone is shut off. Automatically cleared when the zone is done.
Event Day	<ul style="list-style-type: none"> An event day stops all watering and keeps programs from starting. To delete the message, press Next to move to the Delete option, and then press Enter. Automatically cleared when the event day ends.
Flow Devices	<ul style="list-style-type: none"> A high-flow shutdown or an over-budget shutdown stops the system from using the specific flow device. To delete the message, press Next to move to the Delete option, and then press Enter. Deleting the message does not clear an over-budget condition. Change the budget or wait until next month. Not automatically cleared – the user must clear this pause condition.
Flow Switch	<ul style="list-style-type: none"> An open jumper or flow switch stops all watering and keeps all programs from starting. To delete the message, press Next to move to the Delete option, and then press Enter. Deleting the message does not reset this condition. Replace the jumper or reset the flow switch hardware. Not automatically cleared – the user must clear this pause condition.
Low Temperature	<ul style="list-style-type: none"> When the temperature drops below 38° F, the system will pause all watering. To delete the message, press Next to move to the Delete option, and then press Enter. Deleting the message does not reset this condition. You must wait until the temperature rises. Automatically cleared with higher temperatures.

Pause biCoder	<ul style="list-style-type: none">• A pause biCoder will pause watering on specific programs.• To delete the message, press Next to move to the Delete option, and then press Enter.• Deleting the message resets the pause condition before the delay time has elapsed.• Automatically cleared at end of the delay time.
Pause Switch	<ul style="list-style-type: none">• An open jumper or wired switch pauses all watering on the controller.• To delete the message, press Next to move to the Delete option, and then press Enter.• Deleting the message does not reset the pause condition until the jumper or switch has closed the circuit. Then when you delete the message, the controller resets the pause condition before the delay time has elapsed.• Automatically cleared at end of the delay time.
Rain Switch	<ul style="list-style-type: none">• An open jumper or wired rain sensor that is wet (open) stops all watering and keeps all programs from starting.• To delete the message, press Next to move to the Delete option, and then press Enter.• Deleting the message does not reset the pause condition until the jumper or rain sensor has closed (dried out).• Automatically cleared when the switch or rain sensor closes.
Rain/OFF days	<ul style="list-style-type: none">• Setting a rain/off value for the number of days stops all watering for that period of time.• To delete the message, press Next to move to the Delete option, and then press Enter.• Deleting the message resets the delay days to zero and clears the pause condition.• Automatically cleared when delay days are over.
Water Window	<ul style="list-style-type: none">• A water window (white squares) will pause a program.• To delete the message, press Next to move to the Delete option, and then press Enter.• Deleting the message does not reset the water window pause condition – you must wait or change the water window programming.• Automatically cleared when the water window expires (time advances to a blue square).

11 – Troubleshooting

The BaseStation 3200 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 a Specific Two-wire Device

When you test a two-wire device, the controller verifies the communication between the controller and the device. The controller activates the device and measures the current and voltage. It deactivates the device, and measures the voltage drop between the controller and the device.

1. Turn the dial to the **Self Test** position.
2. Press the **Next** or **Previous** button to select **Test Single Two-wire Device**, and then press the **Enter** button.
3. In the **Device to Test** column, press the + or – button to select the serial number of the device that you want to test.
4. Press the **Enter** button to test the device.

The device will activate for less than a second to measure the voltage and current through the device. This test will return information related to the type of device that was tested.

5. When you have finished viewing the test results, turn the dial to the **RUN** position.

Self Test	
Device to Test	Test Results
6: Q006643	Sensor: SB01130
MV1: D003329	06/11/2012 09:01
SB01130	-----
FM1: 00W0268	Moisture: 0.0%
ED: P000116	Soil Temperature: 77.0
-	Two-wire Drop: 0.6
	<input type="button" value="Help"/>

Possible Statuses for Valve biCoders

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

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

Short circuit	<ul style="list-style-type: none"> • Wire connection between the valve biCoder and the valve solenoid is shorted together – repair wire connections. • Valve solenoid is broken – replace solenoid.
No response	<ul style="list-style-type: none"> • Two-wire connection to the valve biCoder is broken – repair wire and connections to the valve biCoder. • 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. • Valve biCoder is damaged – remove biCoder and move it directly to the controller to test its ability to communicate.

Possible Statuses for Soil Moisture Sensors (biSensors)

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

Self-test Status	Cause/Action
No response	<ul style="list-style-type: none"> • Two-wire connection to the biSensor is broken – repair the wire and connections to the biSensor. • 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. • The biSensor is damaged – remove the biSensor and connect it directly to the controller to test its ability to communicate.
Zero Reading	<ul style="list-style-type: none"> • 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"> • Not enough zone water time – increase water time to apply at least ½ inch of water • biSensor not being watered by its primary zone – change the assignment or move the biSensor to the correct location • Program start times are too infrequent – increase the program start time frequency • biSensor limit is too low – raise limit or run a biSensor calibration cycle (refer to page 60)

Ground is too dry with high biSensor moisture reading	<ul style="list-style-type: none"> • biSensor not being watered by its primary zone – change the assignment or move the biSensor to the correct location • biSensor is buried too deep – rebury the biSensor to be only 3 inches deep
Ground is too wet with high biSensor moisture reading	<ul style="list-style-type: none"> • biSensor is buried in low area where water collects – move biSensor from low area • biSensor not being watered by its primary zone – change the assignment or move the biSensor to the correct location • Program start times are too often – increase the interval between start times • biSensor limit is too high – lower limit or run a biSensor calibration cycle (refer to page 60)
Ground is too wet with low biSensor moisture reading	<ul style="list-style-type: none"> • biSensor not being watered by its primary zone – change the assignment or move the biSensor to the correct location • biSensor is buried too deep – rebury the biSensor to be only 3 inches deep • Not enough zone water time – increase water time to apply at least ½ inch of water

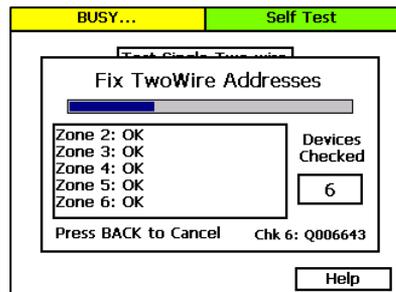
Checking and Repairing Two-wire Device Assignments and Addresses

This process searches for and verifies communication with each of the devices on the two-wire.

Note: Baseline recommends that you back up your controller data before you run this process. Refer to Backing Up Your System on page 88.

The Verify and Repair ALL process does not check the valve current or biSensor readings, and it does not repair any faulty wiring or electrical connections. However, if it finds discrepancies in assignments or addressing between the controller and the devices, it will attempt to repair those discrepancies in the following order:

- Repair valve biCoder to zone number assignments
- Repair biSensor addressing
- Repair pause device addressing
- Repair air temperature sensor addressing



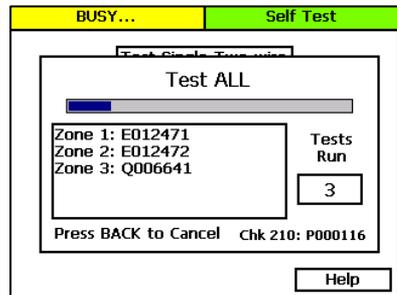
1. Turn the dial to the **Self Test** position.
2. Press the **Next** or **Previous** button to select **Check Two-wire Addresses**, and then press the **Enter** button. The two-wire tests starts immediately. While the test is in progress, the statuses and results display on the screen.

Testing All Devices

Before you begin troubleshooting a problem, run a Test ALL from the Self-Test dial position. 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. The quantity of each device type is also given in parenthesis. This test verifies communication and valve currents, biSensor readings, and other device readings, but it does not make any repairs.

1. Turn the dial to the **Self Test** position.
2. Press the **Next** or **Previous** button to select **Test All Two-wire Devices**, and then press the **Enter** button. The test begins immediately.
3. When the test is finished, turn the dial to the **Reports** position.
 - a. Make sure that **Test All** displays in the Select Report field.
 - b. To scroll through the report, press the **Next** button to highlight the Scroll field, and then press the **+** button.



4. When you have finished viewing the test results, return the dial to the **RUN** position.

Performing a Two-wire Blink Test

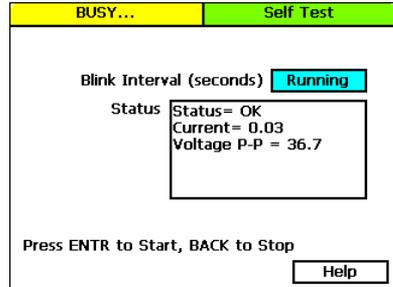
Use the Two-wire Blink Test to find bad electrical connections, broken wires, or device failures. Running this test activates the two-wire path and should cause the communication LED on each device to blink. If an LED is not blinking, check the electrical connections.

Note: It is usually best to perform this test when one person is working at the controller and another person is verifying the blinking LEDs in the field.

1. Turn the dial to the **Self Test** position.
2. Press the **Next** or **Previous** button to select **Two-wire Blink Test**, and then press the **Enter** button. The Self Test screen displays.

3. In the **Blink Interval** field, press the **+** or **-** button to indicate the number of seconds between blinks.
4. Press the **Enter** button to start the test.

While the blink test is in progress, the Blink Interval field displays "Running" and the Status box displays the results.
5. To stop the test, press the **Back** button.



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.

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.

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.

- 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 adding these components does not cause additional failures.
- Connect other two-wire segments, verifying correct operation as each is connected.

Diagnosing a Circuit Board Issue

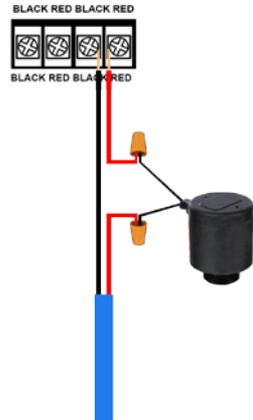
1. Disconnect the two-wire from the controller.
2. Check the controller to determine whether the Over Current message redispays.
3. If the message redispays, you have confirmed a circuit board issue. Contact Baseline Support at 866-294-5847.

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. Set the two-wire to always on. Refer to Setting the Two-Wire to Always On on page 87.
3. 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.”
4. 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.

5. 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.
6. Remove the suspected device from the two-wire path, and then check the controller again.
7. 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.

Troubleshooting: Lost Devices | No Response

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

12 – Appendix

Warranty

Baseline warrants to the original consumer purchaser that new BaseStation 3200 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

Lower Threshold Moisture Sensor Based Watering

Baseline recommends this configuration as a general watering strategy.

1. Install the soil moisture sensor in the landscaping according to the instructions that came with the device.
2. In the BaseStation 3200, search for and assign the sensor. Refer to Searching For and Assigning biSensors on page 38.
3. Set up the soil moisture sensor and assign that sensor to the primary zone that will water it. Refer to Setting Up Soil Moisture Sensor Based Watering on page 59.
4. Assign the primary zone to a program by giving the zone a water time. Make sure the water time for the primary zone is sufficient to lay down $\frac{1}{2}$ " to $\frac{3}{4}$ " water. Refer to Configuring Zone Settings on page 34.
5. Link the other zones in the area that is monitored by the sensor to the primary zone. Refer to Linking Zones on page 47.
6. Set the **Lower Limit** watering strategy for the primary zone. Refer to the topic on configuring your biSensors and setting up watering strategies on page 60.
 - c. Set the **Lower Limit** halfway between field capacity and maximum allowed depletion so there is no stress to the plant material when a day is skipped.
7. Set up the start days and times.
 - a. Start every day if possible.
 - b. Set start time as desired.
8. Set up the **Soak Cycles** for the program. Refer to Using Soak Cycles on page 49.
 - a. Set up at least 3 cycles.
 - b. The soak time should be at least 2X the cycle time for normal soils.

Upper Threshold Moisture Sensor Based Watering

This watering strategy is particularly useful for landscapes that need to reach 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.

This strategy is also useful for landscapes that are under municipal watering restrictions.

1. Install the soil moisture sensor in the landscaping according to the instructions that came with the device.
2. In the BaseStation 3200, search for and assign the sensor. Refer to Searching For and Assigning biSensors on page 38.
3. Set up the soil moisture sensor and assign that sensor to the primary zone that will water it. Refer to Setting Up Soil Moisture Sensor Based Watering on page 59.

4. Assign the primary zone to a program by giving the zone a water time. Make sure the water time is sufficient to get through the longest day interval during the hottest time of the year (typically $\frac{3}{4}$ " water). Refer to Configuring Zone Settings on page 34.
5. Link the other zones in the area that is monitored by the sensor to the primary zone. Refer to Linking Zones on page 47.
6. Set up a **Day & Time** start condition for the program. Refer to Setting Up Programs on page 51.
 - a. Start on desired days.
 - b. Start at desired time.
 - The controller will run every time it is programmed.
7. Set the **Upper Limit** watering strategy for the primary zone. Refer to the topic on configuring your biSensors and setting up watering strategies on page 60.
 - a. Set the **Upper Limit** at field capacity.
8. Set up the **Soak Cycles** for the program. Refer to Using Soak Cycles on page 49.
 - a. Set up at least 3 cycles.

BL-3200 Hydrozone Worksheet

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.				

20.				
21.				
22.				
23.				
24.				
25.				
26.				

Additional Information for Existing Programs

Program	Watering Days	Start Times

Programming Information for the BaseStation 3200 Controller

1. Use the table below to plan connections and programming before physically programming the controller.
2. Determine which zone within each hydrozone will be the “primary” zone. If you are using a biSensor, the primary zone is the zone where the sensor is located. You will set up the watering strategy for the scheduling group based on the readings from that sensor. In the BaseStation 3200 controller, you will designate this zone as the primary zone. Refer to Setting up a Primary Zone on page 46.
3. Determine how the irrigation zones for each hydrozone will be put into a scheduling group. Link the other zones in the scheduling group to the primary zone so they will be watered more or less relative to it. In the BaseStation 3200 controller, you will link the zones in the scheduling group to the primary zone. Refer to Linking Zones (Creating a Scheduling Group) on page 47.

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.

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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						
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

address	When a device is connected to the two-wire, the device is given an address that identifies it to the BaseStation 3200 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. 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 water time 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
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.
linked zone	Within a zone group, there is one primary zone and all other zones are then “linked” to the primary and will get their programming information from the primary (water time, program, schedule, etc.)
lower limit (lower threshold)	This water strategy is programmed by setting the schedule to water every day and then setting the biSensor to allow watering when the moisture level drops below this limit – the controller can automatically set this lower limit after a calibration cycle, or it can be set manually.
mainline	A pressurized pipe that supplies water from the point of connection (water source) to the valves
master valve (MV)	An automatic or manual valve installed on the mainline piping
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
NOMV	Normally open master valve – 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
point of connection	Also known as “water source” The place where the irrigation system is connected to a water supply
powered decoder	A decoder device that interprets the signals that it receives from the controller and tells the valve to turn on or off. A powered decoder is designed to retrofit into existing systems and requires 120 VAC service at installation location.
primary zone	The zone within a scheduling group that all other linked zones are linked to. Changing the programming on this zone will adjust the programming on all linked zones, resulting in saved time and consistency. If you are using a biSensor, the primary zone is the zone that the sensor is connected to.
program	A program is a controller programming concept used to organize watering events. Each program can have different schedules, water days, watering strategies, master valves, etc.
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.

scheduling group	A group of one or more zones that have been linked together for irrigation scheduling. A scheduling group must have one primary zone, and may have one or more linked zones. Irrigation for all zones in a scheduling group will follow the watering strategy of the primary zone, but actual water times and soak/cycle behavior will scale as programmed relative to the primary zone.
soak cycle	When a zone waters using soak cycles, the total water time includes periods of watering 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, rather than on 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 (upper threshold)	This water strategy varies the zone water time each time the program runs in order to apply enough water to raise the moisture level to field capacity.
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 budget	In the BaseStation 3200 controller, the water budget functionality enables you to define and track the total flow for each Flow biCoder per month. You can configure the target flow value in GPM for the Flow biCoder and how the system will react when this number is reached.
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