WeatherTRAK®

Web User Manual

HydroPoint® data systems, inc.

The proven leader in Smart Water Management SM

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Maximize Your Success with WeatherTRAK Smart Water Management

Welcome to HydroPoint's *WeatherTRAK* Solution

WeatherTRAK – Reduce Your Water Footprint

HydroPoint's *WeatherTRAK ET Pro² Central Smart Water Management Controller* maximizes productivity by combining proven maintenance-free, localized weather updates and scientifically calculated irrigation schedules with Central Internet Management. Implementing the *WeatherTRAK* solution eliminates the large capital investment and training costs that are inherent to traditional central controller products. You can manage your account from your office workstation or remotely; on site or while on business travel … anywhere you have internet access.

HydroPoint's customer service is ready to assist you. Our English-speaking and Spanish-speaking teams are available Monday – Friday; 7:00 am – 6:00 pm, and Saturday, 9:00 – 2:00 pm Pacific Time.
(800) 362-8774
support@hydropoint.com
www.weathertrak.com/support

System Overview

WeatherTRAK.net Central web application has been developed for the irrigation manager who oversees multiple controllers as well as those who simply want to have remote visibility into their controller's irrigation schedule and respond to posted alerts.

The web pages have been developed to provide a summary or at-a-glance overview initially allowing a user to quickly scan the information that is important to them, then "drill-down" into more details as needed to make decisions specific to how fast or the importance of responding to an alert with equipment and other resources.

The Home page now has "Quick-Links" specific to workflow tasks such as
- View All Controllers,
- Set Rain Pause,
- Manage Controller Schedule
- Run Manual Irrigation,
- View Active Alerts,
- Manage Alert Notification, etc.

This is intended to allow for faster navigation to specific pages within the web application to help access commonly used features.

The controller information displayed reflects the same data found in the controller in this "at-a-glance" format and is updated on a "real-time" basis as field changes are made or local weather in the form of ET impacts irrigation schedules.

Navigating the Website

WeatherTRAK.net Central makes it easy to view the multiple or single controller information that is important to you. Examples of this are:
- Simple navigation by selecting any one of the 9 tabs in the header of each web page,
- Quick Link buttons expedite page navigation by reflecting common tasks or workflows to another area within the web application.
- Additional Quick Link buttons can also be found on the CONTROLLER LIST and MANAGE pages for any "Active-Alert". A mouse roll-over and click on the posted Alert category will quickly navigate to the Alert page where more station or controller specific information can be reviewed.
- Accounts, Sites and Controllers levels have been introduced so site or controller level information can be obtained, organized and exported in a report form for additional analysis or sharing with a property manager/owner.
- Contextual Page Help Link – Underlined words found on various web pages when rolled over with a mouse and right-clicked will expose more specific detail. This is intended to provide a definition or specific information related to a station, flow or alert.
- Icons / Symbols – have been added with recognizable functions such as PDF or Excel file export capabilities. The "(magnifying-glass)" provides a more detailed view of the summary charts found on the HOME page. The "printable view" icon indicates a specific web page can be exported into either a PDF or Excel format for storage on a computer, or placed in a project notebook. The "?" icon will provide more detail specific to Alert categories, definitions, possible causes, possible remedies and expected controller behavior. Additional symbols have been added to the CONTROLLER LIST page depicting controller status. These are intended to highlight exceptions to "On-line" controller status.
- Report generation - is now an easy 1-2-3 step process along with a definition of the report type selected.   Multiple report options allow choices for multiple controllers for an entire site if needed.
- Next /Previous selectors - have been added to any page that offers controller level information for faster review of specific controllers within an account.
- Filtering / Sorting – filtering of specific information by account, site or controller level and with the ability to export to a PDF or Excel spreadsheet for further development will assist users with a large number of controllers within their account.
- New Search tools – Search for a controller by serial number, by site or account provided faster access or visibility when needed.

Your Home page navigation options are highlighted in the screen capture below:

**Page navigation tabs
Select a controller**

**Links to Manage or
Alerts Pages**

**Quick Links to
common workflow**

Account Creation

Users can be assigned to the same or different controller in separate "Accounts". An account is defined by controllers assigned to a user log-in and password. This is accomplished when a controller(s) is activated with HydroPoint Customer Support. In some cases, different users can view one or more controllers under their responsibility, while an irrigation manager may have access to all controllers under an umbrella of a different account.

The name of a controller can be up to 50 alpha-numeric characters and might be identified by site, or street address and/or the controller's serial number. Currently a user can modify the controllers name in the MANAGE page, but cannot change the site or account assignment.

How the Website and Controller Work Together

WeatherTRAK ET Pro² Series controllers with central or two-way capability will "synchronize" with the *Weathertrak.net* central software automatically and continuously in real-time.
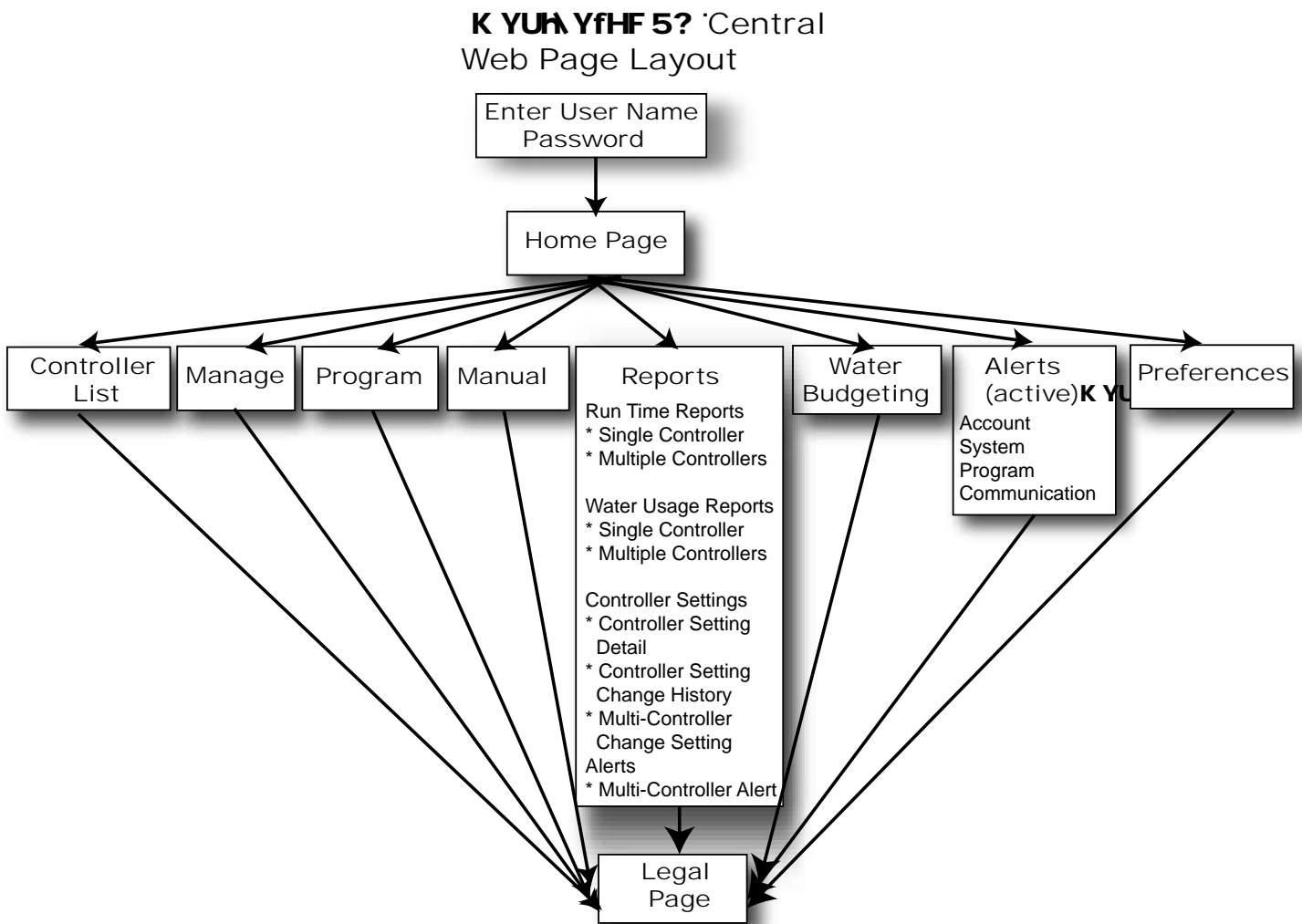- Any change made in the controller (programming, setup, alerts, manual operation) will automatically be uploaded to the web application within a minute of the last knob turn or button press. The exception to this is simply viewing any controller menu or submenu without making a change.   When this synchronization occurs, the third line in the controller's display will flash the words "Synch / Lock" until the upload is complete.
- If the controller is "Offline" meaning connection to the server cannot be obtained, any updated programming information will be held in the controller's memory indefinitely until reconnection to the web application is made.
- A controller's status is displayed on the HOME page summary and in the CONTROLLER LIST page or on the MANUAL page. Messages from the web application can only be sent when the controller status is "On-Line", or in Rain Pause. Messages cannot be sent or received when the controller is "Offline", in System Shutdown or in "Off" mode.
- ET data is delivered to each controller in the evening generally before the first start time of Program A. Confirmation of receipt of an ET message can be found in both the controller in the ET menu or on the web application on the MANAGE page.
- Messages from the web to the controller such as a "Rain Pause" or "Manual" valve operation are downloaded immediately. Program changes made in the web application are sent after the "Send and Save" button is selected. These changes can

be commonly viewed in the controller within 2-3 minutes once this task is executed.

- Alerts triggered by the controller are uploaded to the web application in real-time. If a user's preferences are setup, any message can be forwarded to an email address or sent as a text message to a cell phone.
- All data collected from a controller is stored on a secure WeatherTRAK server for a period of up to 3 years from the controller's activation date.
- One unique feature of the web application is when a station is assigned to Auto mode with either default or user-selected site and landscape attributes but this station is assigned to another station mode, the originally entered data is stored and will re-appear when "Auto-mode" is re-selected.

Key Functions

The following chart provides an overview of the *WeatherTRAK Central* website architecture:

**K YUh YfHF 5? ˙Central
Web Page Layout**

```
                    ┌─────────────────┐
                    │ Enter User Name │
                    │    Password     │
                    └────────┬────────┘
                             │
                    ┌────────▼────────┐
                    │   Home Page     │
                    └────────┬────────┘
```

| Controller List | Manage | Program | Manual | Reports | Water Budgeting | Alerts (active)K YU | Preferences |

Reports:
Run Time Reports
* Single Controller
* Multiple Controllers

Water Usage Reports
* Single Controller
* Multiple Controllers

Controller Settings
* Controller Setting
  Detail
* Controller Setting
  Change History
* Multi-Controller
  Change Setting
Alerts
* Multi-Controller Alert

Alerts (active):
Account
System
Program
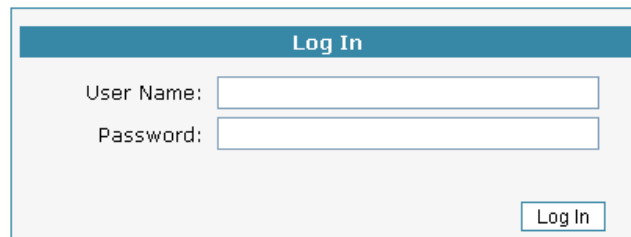Communication

Legal Page

Login

Only authorized users have account access. Here's how to login:

1. Select Microsoft Internet Explorer® versions 7.0, 8.0 or 9.0 or Firefox browsers to access the Internet. While this web application can be viewed o other web browsers such as Mac Safari or Linex, it is supported on IE and Firefox only. The pre-login page will appear to enter your user name (your work or private email address and a password).
2. You may also access the web application from www.weathertrak.com
3. Click the *WeatherTRAK ET Pro^2 Central* button. Please note if you select the *WeatherTRAK ET Pro^1 Central* product, the web pages and function are completely different.

Once the product series is selected, the Login page will appear. Enter your email address and password. Contact *WeatherTRAK* Customer Service at (800) 362-8774 for help with login.

Home Page

> The HOME page is the gateway to all other pages in the Weathertrak.net central software application. Navigation to all other pages can be accomplished in different ways based on the user's preference.
>
> This page also provides a high level summary of all of the controllers within a user's account for communication and alert status in order of severity. A table of Major Alerts is provided with the ability to filter as needed for work order generation or to prioritize personnel and equipment to address posted alerts in a timely manner. Lastly this page also provides updates to new Customer Bulletins, Programming Tips or notification of server maintenance when new software is released.


Upon entering a log-in and password, the HOME page will always appear first. The HOME page allows navigation in one of three methods:

1. By selecting the page buttons or page tabs at the top of each page or,
2. By selecting one of the "Quick Link" workflows on the left-hand margin of the page. Other Quick links also provide navigation to any new Customer Bulletins, Programming Tips or changes in HydroPoint Customer Support Service hours found on the left-margin of this page or,
3. Using the search tool on the left-hand margin called "Manage a Controller." Typing in a search word will commonly navigate to another page within the web application. The entire search word must be entered for this function to search properly.

Page navigation tabs

Select a controller

Links to Manage or Alerts pages

Quick Links to common workflows

The HOME page is intended to provide a "snap-shot" summary of all controllers within this account such as:
- Current controller status by displaying any exceptions to controllers not "On-Line",
- Active Alerts based by severity,
- A more detailed table of the Major alerts (those alerts that have suspended irrigation and require attention) including how long of a duration each alert has existed.
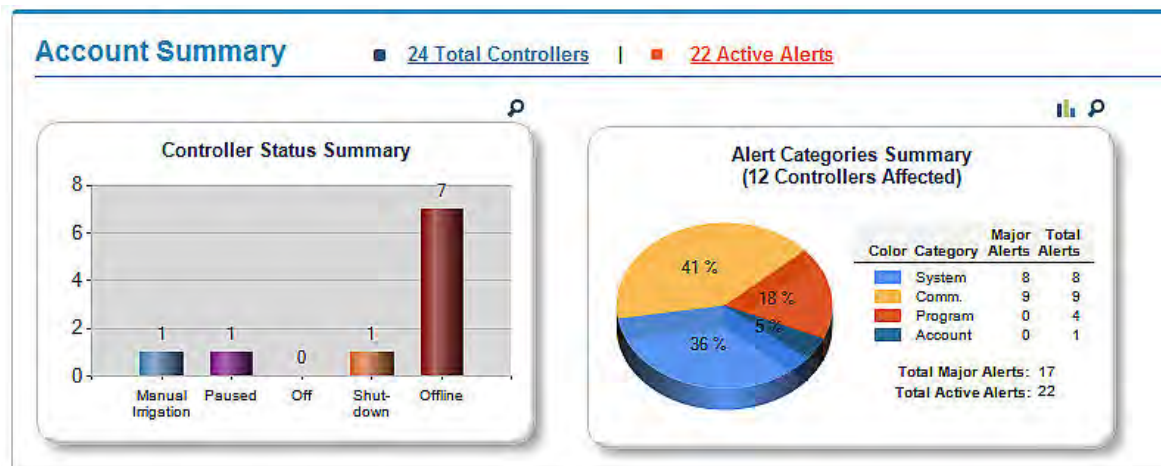
This high-level summary is intended to allow a user to make decisions by "managing-by- exception" of what alert condition needs to be addressed and the order in which a specific alert or sites are addressed.

The "Major Alerts" table is the basis for the pie-chart summaries which can be used to;
- Review or investigate further by selecting a specific issue that will provide a more detailed explanation of the Alert name,
- Filter or sort by site, alert category, controller name, controller name, serial number, or account to view Alerts with the highest severity,
- Export the default or sorted table to a PDF or Excel file which can be the basis of a work order for repairs.
- Selecting the "magnifying-glass" icon will navigate to the CONTROLLER LIST or active ALERTS page for specific details as needed.

⚠ Note: The HOME page does not maintain "page persistence" of a previous filter selection from web session to another.

The "What's New" section found at the bottom of the page is intended to provide links to new Customer Bulletins, Programming Tips or server maintenance outages when new web software is introduced.

Controller List Page

The CONTROLLER LIST page provides a summary of all controllers assigned to a user's log-in and password. The summary information includes individual controller communication status, last received ET, any alerts and allows a rain pause message for a single, multiple or all controllers to be sent as needed. The summary list is intended to provide preliminary information or insight of a controller's status which may require additional investigation. Selecting the controller name or serial number Quick Link button will navigate to the selected controller's MANAGE page where more detailed irrigation scheduling information is displayed. Controller name and current software version

- Account Name - This is the name assigned to a User's account at the time the first controller is activated and is assigned by HydroPoint Customer Service at the user's discretion. This version of the web application can support multiple accounts for one specific log-in and password. The name is limited to 50 alpha-numeric characters.
- Site Name - This represents the name of the site the controller(s) are located within. For example, 3 controllers are assigned to "Towne Center Commercial Center" while another 6 controllers are assigned to "SkyView Homeowner's Association". The site name is assigned at the time the controller is activated and is assigned by HydroPoint Customer Service at the user's discretion. The name is limited to 20 characters.
- Controller Name - The controller name can represent a street address or location. The name can be changed on the MANAGE page and is limited to 24 alpha-numeric characters.
- Controller Serial Number - Every ET Pro[2] controller is assigned a serial number embedded in its software and clearly labeled on the command module faceplate on the controller. This serial number is needed when calling into HydroPoint Customer Support if a controller-related question arises. This number can not be altered.

- Controller Status - The controller status represents the following communication states:
  1. On-line - meaning the controller and web application are in constant communication with one another.
  2. Offline - communication between the controller and the web application has been lost. Offline occurrences can be temporary such as a power outage after several hours.
  3. Off - the controller has been placed in the "Off" position in the field.
  4. System Shutdown – The controller has placed in "System Shutdown" in the field, closing a normally open master valve and suspending all scheduled irrigation indefinitely.
  5. Rain Pause – The controller has been placed in rain pause or has received a rain pause message from the web application or from a rain switch.

- Last daily ET (update) - This column displays ET in inches/day and the date it was received.
- Rain Pause Remaining Days - This column displays the remaining days of a rain pause no matter whether it was set at the controller or from the web application.
- Alerts - This column identifies alert categories (in order of severity) and the number of alerts. Selecting this Alert category will navigate to the Active ALERTS page for more details.

Filtering Controller Information

The information displayed on the Controller List Page can be filtered so users with large number of controllers in their account can view controller information in whatever detail is required.

The page default displays controller information in ascending alphabetic order by Account without any filtering. Selecting the filter radio button (Yes) will expose blank column headers at the top of each column subheading. For example, typing in a specific controller serial number or controllers with specific rain pause duration will sort this displayed list accordingly.

The filter list can also be exported to an Excel or PDF file format for printing, emailing or storing for future reference as needed. Select the file format icon and the following dialog box will appear. Select "Open" or "Save" depending on your requirements.
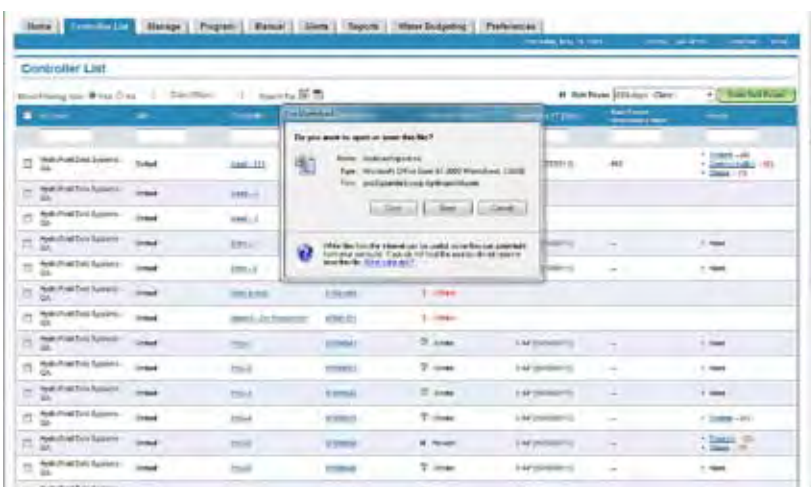
Setting a Rain Pause for a Single Controller or Multiple Controllers

Here's how to set a Rain Pause for a single controller or multiple controllers:

1. Select the Controller List tab.
2. Select the boxes next to the controllers you want to put in Rain Pause. To put all controllers in Rain Pause, click the Select All box.
3. Select the number of Rain Pause days from 1 to 200 days from the pull-down menu in the dark green band on the upper-right side of the page.
4. Click the Send Rain Pause button to transmit the Rain Pause command to a single controller or multiple controllers.
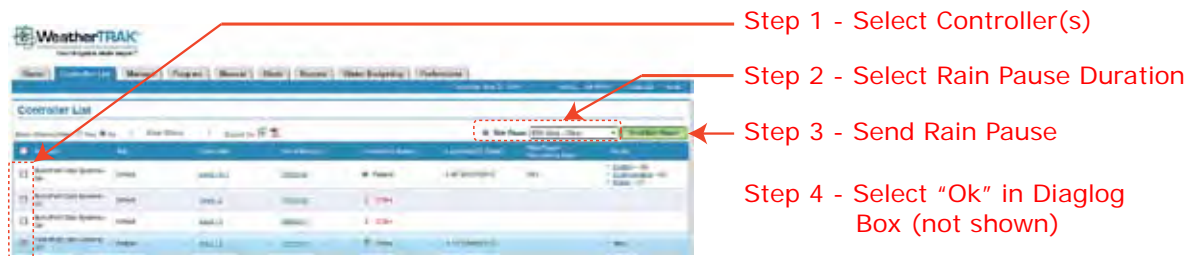
The following message will display when the "Send Rainpause" button is selected. Select the "OK" button to complete this task.
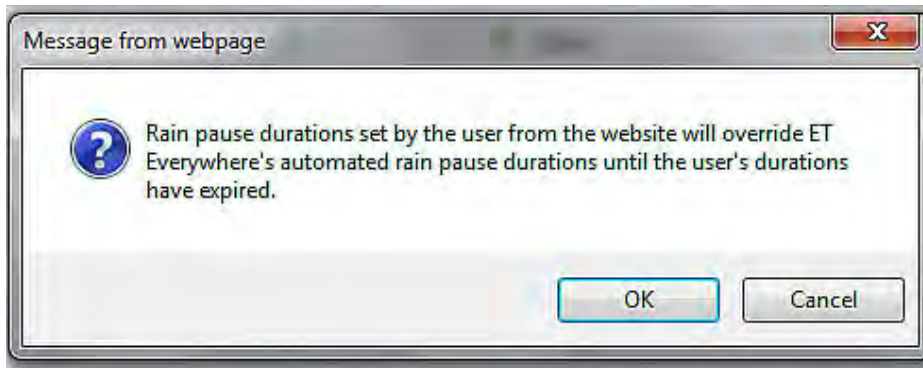
⚠ Caution: The rain pause feature is intended to be used ONLY for rain. To stop irrigation for a scheduled event, use the event pause feature found on weathertrak central. Event pause will pause all stations regardless of the Usable Rainfall setting.

Note: The controller counts down and resumes a rain pause at the Schedule A start time. For example, if you set a one day rain pause to begin at 6pm and Schedule A begins at 9pm, irrigation will STILL occur at 9pm. In this instance you would set a TWO DAY rain pause. Be sure to select days accordingly.

Manage Page

> The MANAGE page provides a summary of controller details and a projected irrigation schedule on a station-by-station level based on the last received ET value. This page also allows station level re-assignment to another program or adjustments when a portion of a landscape is too wet or too dry. The displayed irrigation schedule can also be updated to view any scheduling impacts made from the PROGRAM page.
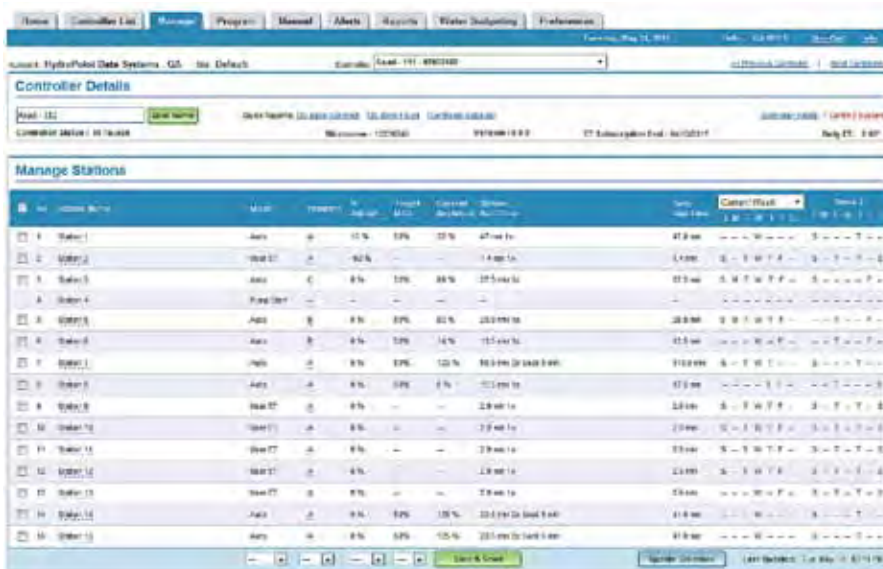
Navigation

The account and site assigned to the controller name are above the "Controller Details" section. A drop-down list of all controllers assigned to the account can is found in the center of this page.

A second navigation method is to select "Previous / Next Controller" link/ button in the upper right-hand corner of the page.

Controller Details

In the "Controller Details" section the following features can be viewed:
- Controller Name - The controller name can be changed up to 24 alpha-numeric characters. Remember to select the "Save Name" button to save any edits.
- Controller Status - The current controller status which can represent anyone of six states will be displayed to the right of this subheading.
- Quick Reports - Selecting any one of the three Quick Link buttons within this section will generate a report reflecting the last 30 calendar days for this specific controller. Quick Reports that can be viewed are:
- Station Runtime Report,
- Water usage (flow accumulation) Report,
- Current controller settings Report.
- Microzone - This value represents a number assigned by *WeatherTRAK's Climate Center* based on the controller's longitude and latitude. A microzone is a polygon shape of approximately 1 square kilometer. A site can represent more than one microzone depending on the size of the property, the number of controllers within a site and their relationship to *WeatherTRAK's* microzone grid.

- Version - This value represents the controller's current software version. If the software version is updated, this software version number will change.
- ET Subscription End - This date will appear as soon as the controller is activated by HydroPoint Customer Support and represents the expiration date of HydroPoint's *ET Everywhere*™ subscription Service. This date will change as the ETE subscription service is renewed. This service provides daily ET weather updates and fully access, free software updates to weathertrak.net central software and access to HydroPoint's Customer Service or email support as needed.
- Active Alerts specific to this controller - A hierarchy of alert severity and number of alerts per category is displayed. Selecting the Quick Link button on the Alert category, will open the active ALERT page to provide more alert details.
- Daily ET - This is the last received ET in inches/day. A mouse roll-over this value and a right-click will display the exact time of day this message was received.

Manage Stations

This section of the MANAGE page displays specific station irrigation information based on the last received ET message. This page size can be lengthly depending on the station's active stations and displays the following information:

- Station Number - Station numbers are always displayed in ascending numerical order.
- Station Name (if used) - A station name can be entered up to 24 alpha-numeric characters. A mouse roll-over and right click will expose all of the station mode attributes including current depletion and any flow information if flow monitoring is used. This pop-up box also has a Quick Link button to navigate to the PROGRAM page in the event a specific station setting needs to be edited.

- Station Mode - Station mode represents one of the four modes known as:
  - Automated by *WeatherTRAK*
  - User w/ ET
  - User no ET
  - Off

- Program Assignment - A station can be assigned to any one of 4 Programs, A, B, C & D. A station can only be assigned to one program at a time and a Program must have a start time, water window and water days to automatically irrigate. A mouse roll-over and right click will expose all of the program mode attributes including 1st and 2nd start times, water window durations, water day modes and exclusions if selected. This pop-up box also has a Quick Link button to navigate to the PROGRAM page in the event a specific station setting needs to be edited.
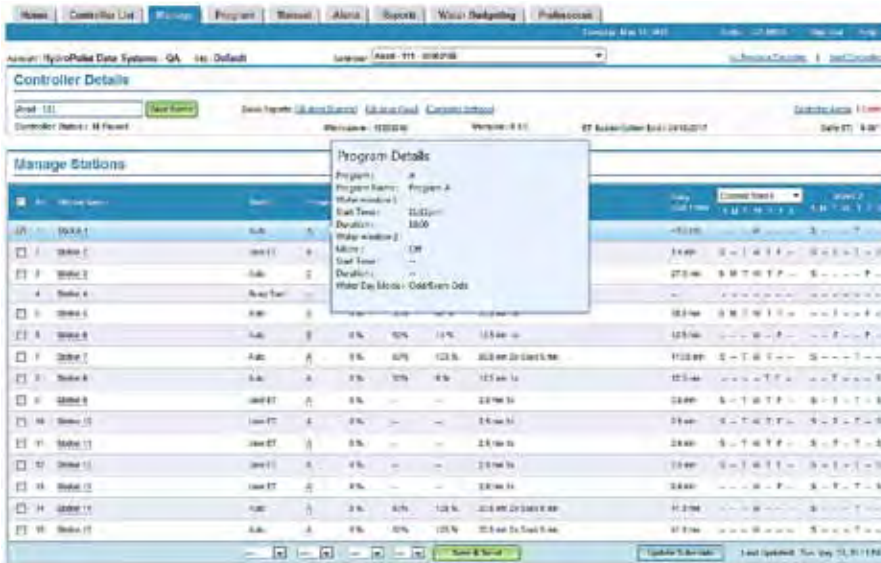
- % Adjust - Increasing or decreasing this value from 0% will apply a increase or decrease to the received ET which will impact the station's runtime but not add or subtract cycle or soak periods.
- Target MAD - Changing this value above 0% will elongate the period between scheduled irrigation by increasing the Target depletion default value above 50%. Lowering the value below 0% will increase the frequency of irrigation watering by decreasing the Target depletion value to less than 50%.

⚠ Note: This feature does not increase or decrease a station's runtime.

- Current Depletion - This is the station's corresponding current depletion value based on the last received ET. A low depletion value from 0-10% is indicative of recent irrigation while a value between 30-45% represents pending scheduled irrigation.
- Station Run Time - This column displays the calculated or user-defined station run time including the number of cycle times.
- Daily Run Time - The daily run time is the accumulated runtime multiplied by the number of cycles.
- Projected Irrigation Schedule - This two-week calendar reflects the projected scheduled irrigation for a corresponding station based on the last received ET and current depletion value. This irrigation water day schedule can be viewed two-week increments from 1-8 weeks. This schedule will change based on daily ET values as weather changes and station depletion increases.

Making Irrigation Schedule Changes

A single, multiple or all stations level change can be made on this page by selecting specific stations or all station check boxes and using the pull-down menu choices at the bottom of this page to make wholesale changes as needed.

Step 1 - Select Controller

Step 2 - Select Station(s)

Step 4 - Select "Send & Save"

Step 3 - Select a Value to be Changed

Send and Save

Any changes made to the station name, station mode, % Adjust, Target MAD must be "Saved" before navigating to another web page or closing the current web session. These changes will be send down to the controller (when in On-Line status) immediately and changes will generally appear within 2-3 minutes. Select the "Send and Save" button to complete this task.
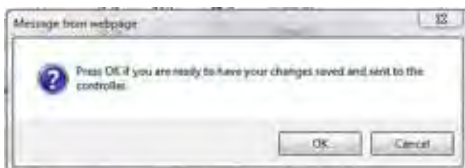
Update Schedule

If any MANAGE or PROGRAM page changes have been made and you wish to view the impacts to the irrigation schedule based on these changes, select the "Update Schedule" button. When selected, a dialog box will appear identifying a time length of approximately 3 minutes for this task to be completed. Once this time frame has expired, press the F5 key on your keyboard or select "View" from the task bar or select "Refresh" to display the updated schedule.

Program Page

📖 The PROGRAM page provides a comprehensive or partial view (based on a user's preference) of a selected controller's programming information. This allows for remote setup or reprogramming of a controller using the same menus found in the *WeatherTRAK ET Pro[2] Series* controller in the field. Controller menus represented are:

- Setup
- Days / Time
- Stations
- Flow
- ET

This page is designed to "open and collapse" sections as needed. For example, if a specific controller does not have flow monitoring capability this section can be collapsed until needed.

⚠ Note: The web application has page persistence and will remember a user's preference of which sections are opened vs. collapsed from one web session to another.

Page View

This particular page functions differently from other web pages in two ways:

1. The programming page comes up in full edit mode for your convenience. To view a summary of all of the settings or to print them, click on the "Printable View" link at the top right corner of the page.
2. "Expand" or "Collapse" a section or the entire page as needed. This is intended to save time by eliminating having to toggle back and forth between different web pages to view specific controller information.

Navigation

Navigation within this page can be accomplished in any one of the following ways providing more user flexibility. These methods are highlighted in the screen capture below:

- Quick Links – underlined sections under the page name can be selected to open up a single section,
- "Expand All" – selecting this under the quick links will open all sections on this page.
- Selecting "Collapse All" or "-" symbol will close all sections or the specific section selected.
- Individual section "+" will open the corresponding section.

⚠ Note: The Program page initially opens with all sections expanded. The web application will remember what sections were opened from one web session to the next and will open this page in the previously left state no matter what controller within the account has been selected.

⚠ Note: You must select the "Save" button for any data entry or changes. Data will not be saved if navigation to another page occurs before the "Save" button is selected.
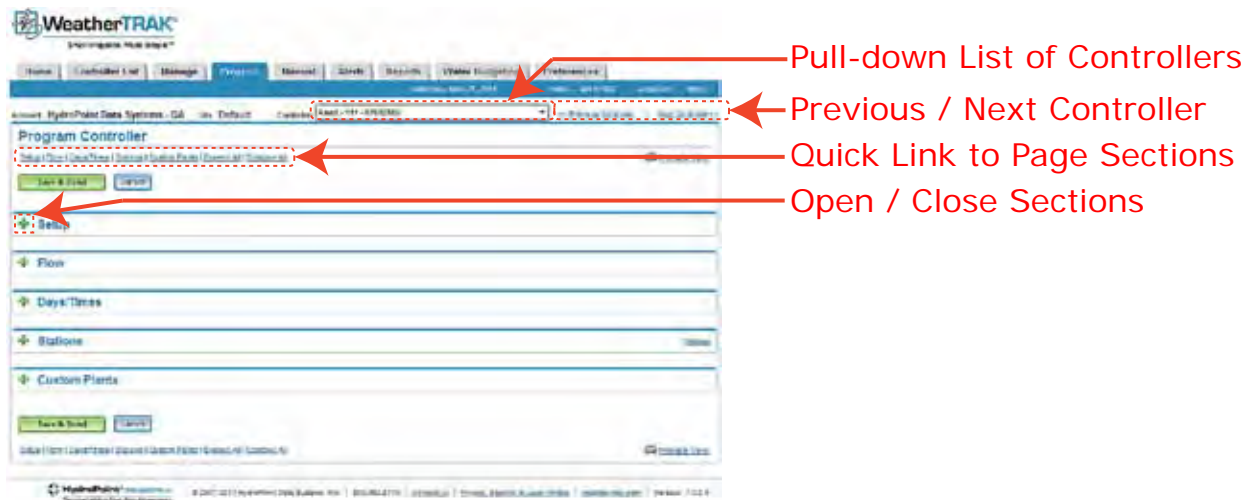
If during entering or editing the controller data an error is discovered, (made changes to a different controller other than intended), press the "Cancel" button and all previously entered data will be removed and the page will reset the program values back to the last "Save." Individual programming functions can be opened and closed simply by selecting the "+" or "-" symbols to the left of the section name.

Selecting a Controller

There are two methods to edit any controller within an account from this page. The first is to use the pull-down list to the right of "Controller Name". The second is the Quick links on right side labeled "Previous Controller" and "Next Controller". Selecting either one will display the previous or next controller in ascending or descending alphabetic order.

Setup

The sub-functions found in the controller menu in the field are identical in this section. Choices can be made from pull-down lists or radio buttons. Limits of the value range are identified in gray-out text where applicable. The controller attributes in this section are commonly established once and maybe opened for reference. Controller functions that can be established in this section are:

- Time Zone
- Auto Daylight Savings Time
- Max Active Stations
- Stack or Overlap mode
- Master Valve Type
- Pump Start
- Run Time Valve Test
- Max Back Up ET
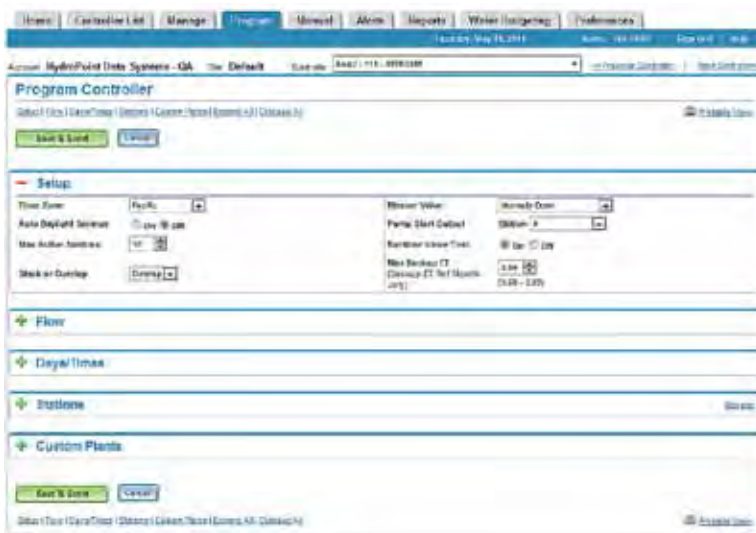
Time Zone – Select the time that represents where the controller is located. The default is Pacific.

Auto Daylight Savings Time – Selecting "On" will allow the controller to automatically change time twice a year specific to the time zone.

Max Active Stations – Select the number of stations that will be physically wired into the controller. Failure to do so could result in false "Water Window" alerts as the controller attempts to irrigate all identified stations within a user-defined water window. A pump station assigned to a station output can be excluded from total number of stations if desired.

Stack or Overlap Mode – The factory default setting is "stack" meaning each station operates sequentially one after another. In this application a single water window duration and start time can be selected. If site requirements allow for more than one station to operate simultaneously, then select 'overlap" mode. Individual start times, water windows and water days can be assigned to each program allowing for stations to operate at the same time or only during specific hours.

Master Valve Type – If the system has a master valve, select one of two types, normally closed or normally open. The default value is 'none."

Pump Start – If a pump exists, any station can be assigned as a pump start output. When selected, this station cannot be assigned any site attributes from Auto mode or assigned to any specific program. The sequence of operation is the master valve will open first followed by a pump start, then individual stations.

Run Time Valve Test – This feature allows the controller to automatically monitor remote control wire integrity and report any valve shorts (SH) or no connects (NC, or broken wire) each time the controller irrigates from a scheduled start time. The default setting is 'Off".

Max Back-up ET – This value should reflect the month with the highest ET (typically July). The controller will use this value and adjust for the month of the year from this value in the event that daily weather updates are not received after 5 consecutive days. For example, a lost com occurs in the month of May after 5 days. The controller will use the Max Backup ET value and adjust the ET for the month of May accordingly as a fail-safe to protect you landscape investment until the communication can be restored.

Flow

This section is used to enter flow meter data when a flow sensor is installed. All functions are grayed-out until the "Flow Mode" is changed from its default value of "Off" to "On". Choices can be made from pull-down lists or radio buttons. When a flow meter size is selected, default K and Offset Values are automatically displayed. Either value can be edited if piping is material other than PVC and more accurate flow data collection is required.
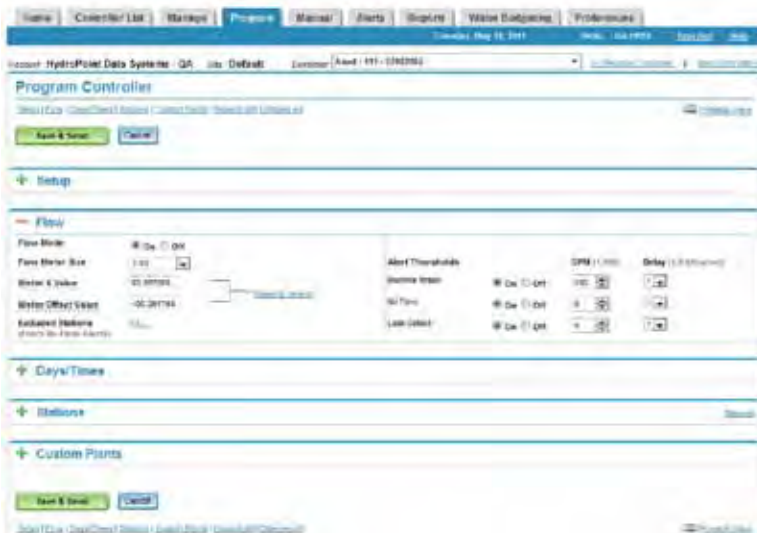
Program Page – Flow Section Insert

A mouse roll-over and right click on the underlined "K or Offset" values will display a table of other compatible flow sensors and their corresponding K and Offset values. These values can be cut and pasted individually into the corresponding window. This pop-up must be manually closed by selecting the "X" in the upper right hand corner of the table.
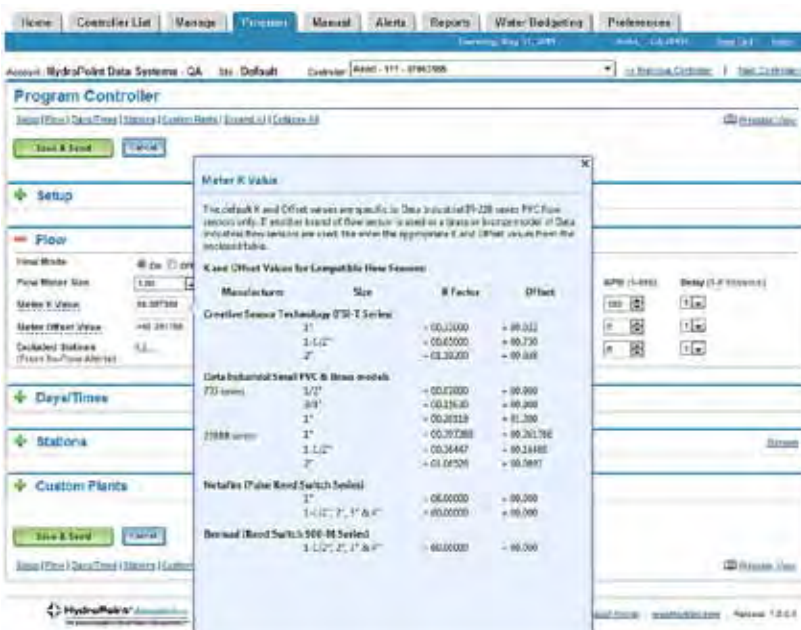
⚠️ Note: The individual "station flow global offset" or "station high flow threshold" observed on the controller does not appear in this software version

In some applications, the flow rates of certain stations maybe outside of the flow range of the flow sensor. This is common when drip zones watering in GPH are on the same mainline with other stations using rotors or fixed spray heads. Any station from 1 to max active stations can be selected by moving the mouse to the "edit" link for "Excluded Station". The default value is that all stations will be monitored and a station must be selected to be excluded. Move the mouse pointer to the box left of the station number and click to exclude a station(s). A "check" will appear when a station is excluded.
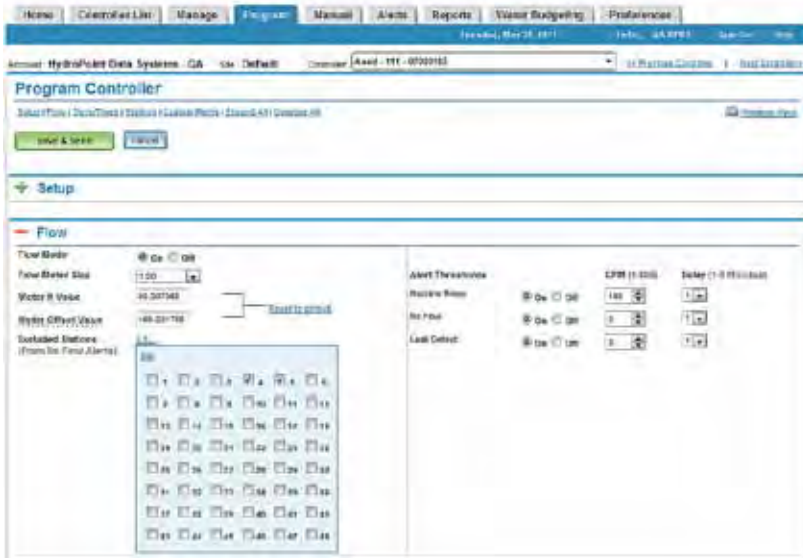
After checking the stations for exclusion, click on the "Set" link at the top left corner of the box to set the stations. A summary of excluded station(s) will appear to the right of the "Excluded Stations" sub-function in blue text.

Flow Monitoring Functions

For sites that incorporate flow sensors, this section allows for the following setup features:
- Flow mode (On or Off) default is Off
- Flow meter size
- Corresponding K and Offset values for PVC piping based on the size of flow sensor selected
- Excluded stations from No Flow Alerts
- Establishing Mainline Break, No Flow and Leak Detection threshold values in GPM and delay period which is the period in which the controller waits before a flow alert and response is triggered.

One or more flow monitoring functions can be shut-off independently from one another. The default value is that all flow monitoring functions are "On" unless turned "Off". The irrigation system variables used to determine flow thresholds settings are commonly the mainline size, the station with the highest flow rate and station with the lowest flow rate and if hose bibs or quick couplers are installed and used for periodic maintenance. These are based on known values based on the mainline pipe size and valve station flow characteristics. The GPM and delay values displayed are defaults identical to those in the controller and can be edited as needed.

Flow thresholds can be defined from 1-995 GPM in 1 GPM increments from 1-30 GPM and 5 GPM increments from 30-995 GPM. A delay period can also be defined before the controller acknowledges an alert and responds according to the type of alert message. The range of delay is from 1-6 minutes in 1 minute increments.

Days / Times

Several tasks can be accomplished in this section as follows:
- Assign a name to a program (up to 24 characters) (new)
- Assign a start time to program
- Assign a water window to a program
- View the end time based on water window length selected (new)
- Assign a second High ET start time
- Assign a water window for the second High ET start time (default is Off)
- View the end time based on the water window length selected (new)
- Assign one of six water day modes to each program

The *ET Pro^2* series offers 4 independent programs, each with independent start times, water windows (as long as the accumulative total does not exceed 24 hours) and water day modes. A station can only be assigned to one program. Select "overlap" from the SETUP section to assign staggering or the same start times for each program.
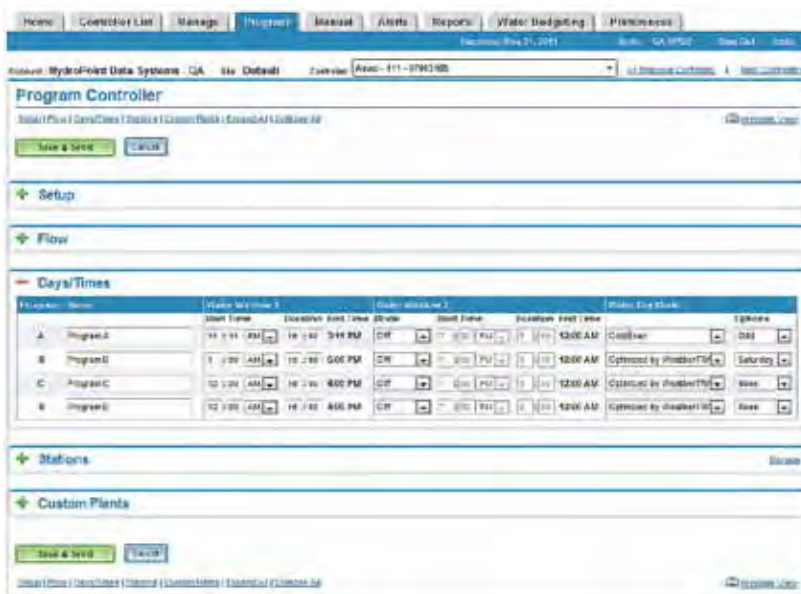
Establishing Water Windows

A new feature in Days/Times is the ability to assign a name to any one of the four programs (A, B, C or D) up to 24 characters long. This function is only available on the web application and will not be available on the controller until the next controller software update.

Select the 1st start time within a 24-hour period and remember to verify AM or PM before moving to water window duration. The web application displays the end time of the water window based on both the start time and water window duration. Water window durations have a range from 1 hour minimum to 23 hours, 59 minutes maximum.

Select the 2nd start time if daytime temperatures and/or high winds deplete the soil reservoir before the next scheduled irrigation. The trigger points for the 2nd High ET start time are:
- Current ET,
- Plant type,
- Soil water holding capacity and
- Root zone depth.

For example, a station(s) with high water use plant types, shallow root depth (commonly below 3"), in sandy soil where high daily ET's cause depletion sooner than the next scheduled irrigation day are factors that would trigger a 2nd High ET start time. The controller will automatically calculate which stations reach maximum allowable depletion and will irrigate accordingly.

⚠ Note: The 1st and 2nd start times for a program cannot overlap and the combined water windows cannot exceed 24 hours. If an overlap occurs, a red warning message will appear alerting of a programming conflict and the settings must be resolved before programming changed can be "saved".

Water Day Modes

Select one of six water day modes noted as follows:

Optimized by *WeatherTRAK* – the controller automatically calculates water days for each station independently when the soil reservoir evaporates to 50% or more. Excluded days may be selected under the "Options" column. The same column allows for other selections depending on the "Water Day Mode." When necessary, one day per week can be selected as an "exclusion day". If additional exclusion days are necessary, then select "Days of Week" mode.
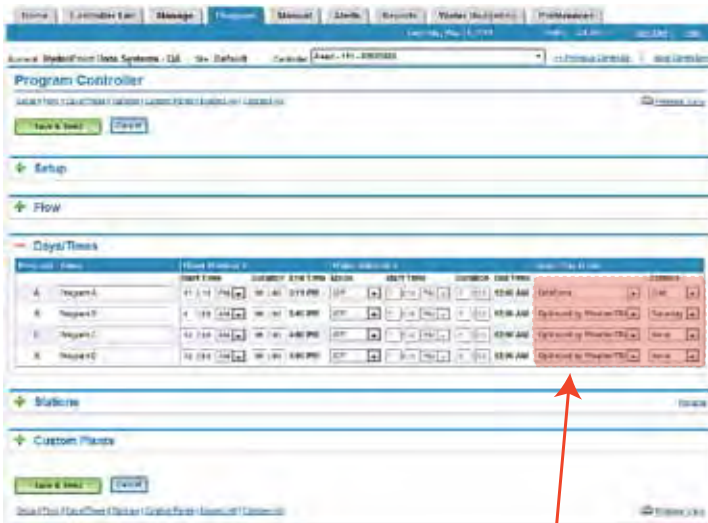
Water Day Mode by Program

⚠ Note: In climates were high ET's are expected, multiple day exclusions can result in Water Day Alerts. This is defined as depletion occurring sooner than the next scheduled water day. This can result in severe plant stress or loss if additional water days are not added.

- Odd /Even calendar days - select one or the other calendar days.

- Day Interval – select from a day interval from 1 (everyday) to 31 days between irrigation. The default is setting everyday.

- Days of Week – select days of week. The default setting is that all days will irrigate. To remove a selected day, move the cursor to the specific day and click.

- Days of week by Month – select the irrigation days for each month (for the entire month) dependent upon site needs. The default setting is all days are selected. Selecting a day of week and removing the check in the box will omit irrigation for this specific day.

- Off –turning a program off suspends scheduled irrigation starts indefinitely until another water day mode is selected.

Stations

In this section, stations are assigned to a program, station mode, and the parameters available for that stations mode. Each station can be assigned to one of four station modes independently of one another.

This section also allows for "fine-tuning" if a station is applying too much or too little water by using the % Adjust or Target MAD (formerly known as "Frequency Adjust" functions). Maximum Allowable Depletion (MAD) determines how often irrigation occurs between watering days. The default Target MAD is 50% and can be adjusted up or down in 5% increments. Similar to the controller, both functions can be used on an individual station basis.

Each of the column headings in "Stations" can be sorted based on user preference. Simply move the cursor over the heading to be sorted and click. The page will take a few moments to refresh. Sorting preferences will not be stored between web sessions.

Station Name

A new feature has been added to the STATIONS menu exclusive to the web application. You can now enter or edit a station name up to 24 characters long. This will not be available on the controller until the next controller software update.

Station Modes

There are four station modes to choose from:
- Auto (Automated by *WeatherTrak*) – the controller will automatically calculate run time, cycle and soak periods when valve (site) specific and environmental parameters are selected on a valve zone by zone basis. These calculated run times are then adjusted by daily ET updates.
- User ET – User defined run times, cycle and soak periods that are then adjusted by daily ET updates.
- User noET – User defined run times, cycle and soak periods without ET as an adjustment – commonly for new landscapes.
- Off – suspends run times, cycle and soak periods indefinitely until assigned to one of the above three station modes.

Entering / Editing Data

To enter data in the section, move over the "+" and click once. This will expand the section displaying three stations modes:
- Auto mode
- User Mode (combined User ET and User No ET modes)
- Off

Any or all station modes can be edited by changing each one individually or multiple stations at one time by following the steps below. Select the station(s) where data will be entered or edited by clicking the corresponding check box on the far left side of the page. The page will refresh and editable pull-down lists or fill-in boxes will appear directly under the station(s) selected. Enter or edit the data as needed.

Each of the three sub-sections displayed under "Stations" has a "Preview Changes to ☑" button which is an option for saving the same setting change to multiple stations at one time. To use this function, use the following steps:

Step 1.   Select the corresponding check box for the stations to be selected.

Step 2.   Select one of the attributes within the section to be edited and make the editing change.

Step 3.   Press the "Preview Changes to ☑" button to execute this change or other changes across the stations selected.

⚠ Note: Pressing the "Preview Changes to ☑" button does not save these changes. Press the "Save" button before leaving this page or previously entered or edited data will be lost.

A "Quick Link" can be found on the upper right hand margin of the "Stations" section called "Manage". Once a field has been edited and saved, selecting this "Quick Link" will open the Manage Page for this specific controller. The results of any edits made in Stations can be viewed in the Manage Page once the changes are "Saved".

Auto Mode

There are two quick links in this station mode offering a basic and more advanced method of entering data. The primary difference between the two is the accuracy or fine-tuning capability offered in the "Advanced" function.

Pull-down or fill-in boxes will appear allowing for changes to individual site and environment attributes as needed. The screen capture above displays some of the attributes that can be changed in the "Basic" mode. **Remember to select the "Save" button before exiting this page or data will be lost.**

Basic Mode

This mode displays 9 of the 15 most commonly used parameters necessary to develop a run time, cycle and soak schedule. In this mode, the web application will use assigned defaults for usable rainfall, water within the user defined water window, sprinkler precip rates, and sprinkler efficiencies. These can be edited by selecting "Advanced" mode.

Advanced Mode

This mode provides more capabilities to refine a station's information for more accurate run times and water savings. These include selecting to irrigate this particular station outside of the water window (perhaps a drip station), changing Usable Rainfall (for a station under a covered roof) or editing a sprinkler's precip rate or efficiency to increase or decrease watering times. A dialog box will appear when navigating from "Basic" to "Advanced" display menus verifying that any previously made changes should be "saved". When "Ok" is selected the web application will save all previously made changes before displaying the "Advanced" menu functions.

User Mode

User defined runtimes, cycle and soak periods can be entered or edited in this mode for either User ET or User No ET modes. The only difference between the two modes is User w/ ET requires a reference ET for the Month of July to be entered. The program entered must also be valid for the month of July. Alternately, reference ET can be for any other month as long as the program entered is valid for that same month. If this value is unknown, call *WeatherTRAK* Customer Service and provide them with the microzone of the controller being programmed from the Controller List Page.

Data is entered or edited in the same manner as Auto for either individual or multiple stations.

⚠ Note: Reference month can only be modifed in User with ET, when Days of Week by Month water day pattern is selected.

Off Mode

Any station can be defined as "Off". This may be required for periodic maintenance, repairs or a special event. In this station mode, a station(s) selected will be suspended from a program with a start time indefinitely until assigned to another station mode. Turning a station off does affect station depletion.
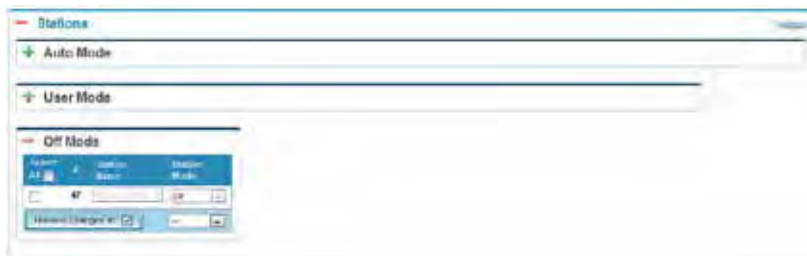
Custom Plants

This section allows for entering custom crop coefficients (Kc) for Plant A, Plant B or Custom Turf similar to sub-functions found in the "ET" menu on the controller. All three are place holders and Custom Turf can be used for other applications (fruit bearing trees as an example) where known monthly Kc data can be entered.

The Kc information for Custom Plant A and B can be entered once for all 12 months within the range noted. Similar information, but on a monthly basis, can be entered for Custom Turf. Expand the section by selecting the "+" button. Use the up and down arrows to increase or decrease the Kc value by 0.10 increments.

Save & Send, Cancel
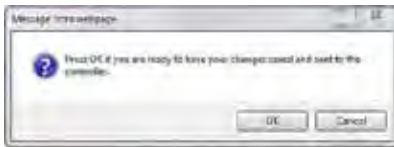
Before leaving the page, select the "Save & Send" button to prevent loss of any entered data. When the "Send and Save" button is selected, a dialog box will appear asking for confirmation of this task. The Program Page will disappear as the saving and download process is initiated. The saved changes are sent to the controller within a few minutes if no other communication or messages are being up or downloaded to the specific controller.

If changes are made but you don't want to save them, press the "Cancel" button, and the page will refresh the data to the last saved before the page was opened.

⚠️ Note: No additional changes can be made to this specific controller until this task is complete. It is possible to navigate to other pages or make changes to other controllers within an account during this time period.

Previewing Irrigation Schedules

To preview the impacts of a specific station's data on scheduled irrigation, calculated run time, cycles or soak periods, select the "Manage" quick link from the "Station" section header. To view the impacts of the irrigation schedule, navigate to the Manage page. the Manage page will display the remaining time for the Save & Send task to be completed.

⚠️ Note: Before any changes can be "Previewed", select the "Update Schedule" button. Changes will be lost if the page is closed before saving any changes.
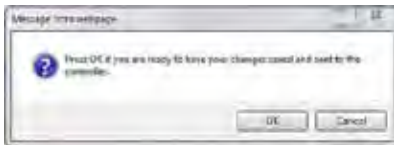
Manual Page

📖 The MANUAL page provides two separate and unique features noted as:
1. Remote manual operation of any station, in any order with a user defined run time for all or specific stations. Remote manual operation can be initiated for a specific controller, then one or more other controllers within the same account at the same time.
2. View a "snap-shot" of the controller's current operating status.
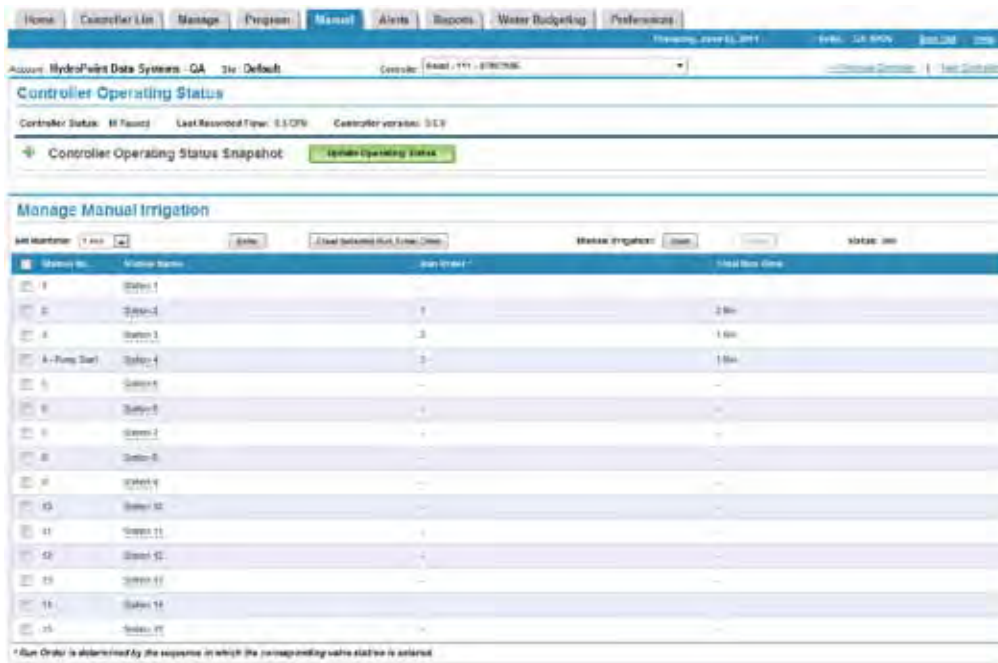
⚠️ Note – Viewing a controller's current operating status is allowable for controllers with v6.0 controller software and higher. This can be determined at the top of the Manual page. To upgrade a controller's software, contact HydroPoint Customer Support (800) 362-8774.

Manual Watering

You can manually irrigate any station or all stations directly from the website. You can also assign the same or different run times to a single station or all stations. The default run order is numerical (1, 2, 3, 4 and so on), though it's easy to create any run order you prefer. You may also setup manual watering for multiple controllers by starting with one controller and then selecting another. Here's how to water manually:
1. Select the Manual tab.
2. Select a controller.
3. Select all stations, a single station or multiple stations, depending on your need. To set your own run order, select and assign run times to each station independently.
4. Select a Runtime from the pull-down menu. Click Enter. The selected run time appears in the far right column for the selected station.
5. When stations and Run Time are selected, click the Start button to start manual watering. Expect a 15-20 second delay before irrigation begins.
6. Note the status indicator at the bottom of the page. Once all stations have been irrigated, the run time and order will display until you re-select the corresponding station and click the Clear Selected Run Time/Order button.

To stop manual watering, click Stop. When you're ready to resume irrigation, clear the run time and order which were set up in step 4.

This section is intended to provide a summary of what stations are currently operating and also take a "snapshot" of the controller's current flow rate if currently operating. If a broken sprinkler head or lateral pipe exists, the current status can be compared against the "Assigned or Learned" station flow.
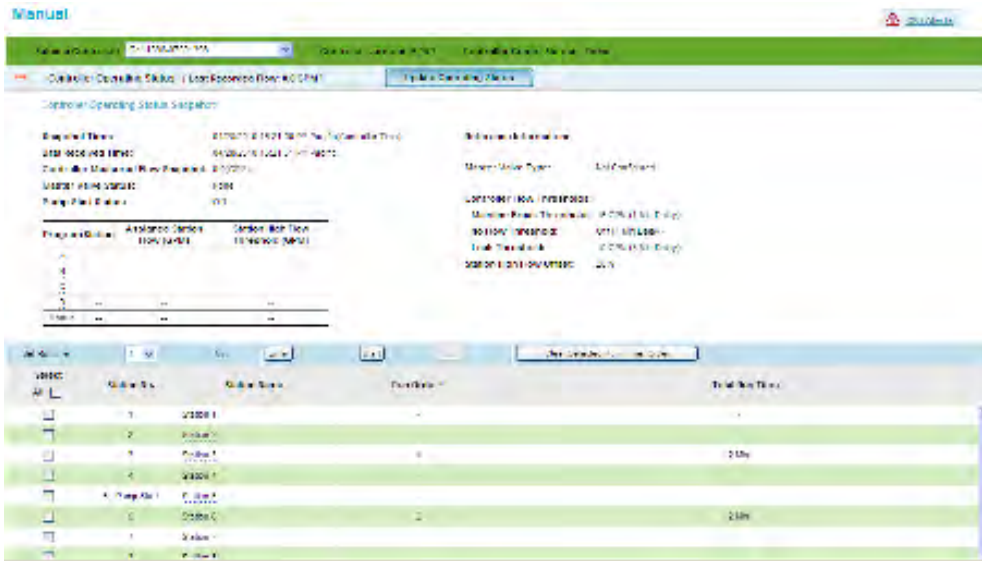
Individual stations names, when entered on the Program page, are visible for each individual station. These are view only and can only be edited in the Program page.

To operate a station "manually" from the web use the following steps:
- Select the controller you want to operate manually and confirm the controller is "on-line"
- Select a stations or stations
- Select a specific run for each station or the same runtime for all stations.
- Select "enter" to confirm the runtime selected.
- Select "Start" to begin irrigation.

To stop irrigation select "Stop".

⚠ Note: The web application will remember the previously selected stations and runtimes. To clear previously selected stations, select the "Clear order and runtime" button.

Step 1 - Select Controller

Step 3 - Select Runtime

Step 4 - Select "Enter"

Step 5 - Select "Start"

Step 2 - Select Station(s)
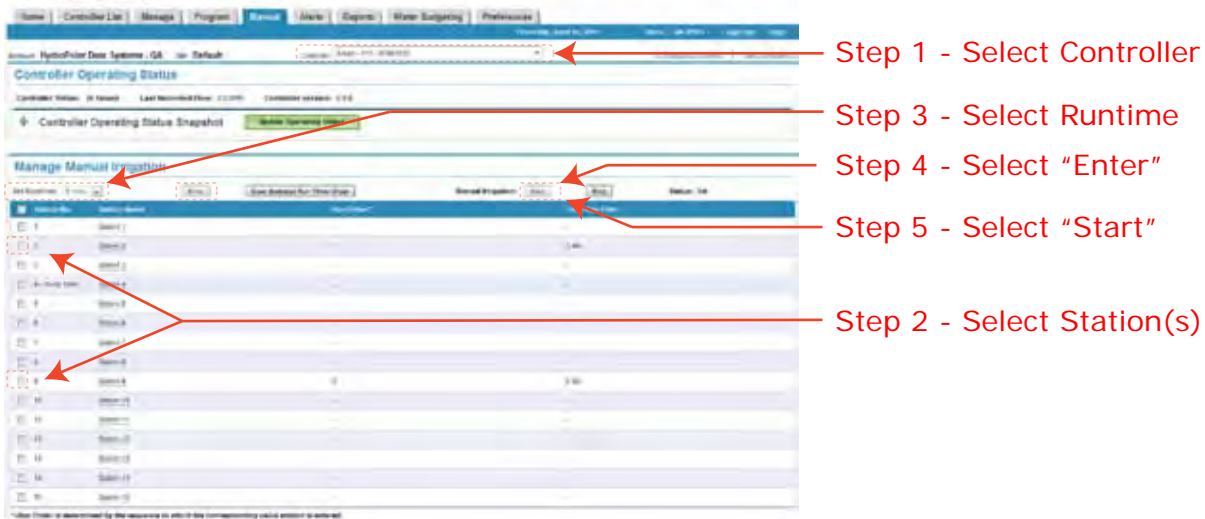
⚠ Note: The MANUAL page now displays the controller's communication status in the header at the top of the page as noted in the screen capture above. When the controller is in this state, "Controller Operating Status" cannot be observed until the controller's communication is restored and is displayed as "On-Line".

Alerts Page

The Alert page provides a summary of all "active" or "current" alerts for a single, selected number and/or all controllers within a user's account. Filtering also provides choices to view a single Alert category vs. all. Active alerts that can be viewed on this page are:

- System
- Communication
- Account
- Program
- Irrigation Status

Note: Once an Alert is "cleared", it is no longer considered an "active" alert and is not posted on this page but a record of it can be viewed and published from the REPORT page.

Reports Page

📖 This feature allows a user to generate, export and/or print any one of the following reports for a single or multiple controllers;
  - Runtime Reports
  - Water Usage Reports
  - Controller Settings Report
  - Controller Settings Change Report
  - Controller Settings Details

These reports can be used for troubleshooting a field issue or determining why irrigation may or may not have occurred depending on the type of alert or an event such as a rain pause or system shutdown. A second use of generating reports might be to include as part of a monthly update to a property owner, HOA board or others of water savings, or other methods of determining compliance to landscape maintenance specifications, or local water district regulations.

⚠ Note: Today's date cannot be selected because irrigation may not have completed for the day.

⚠ Note: Only scheduled irrigation is reported on the RunTime usage report. Manual watering usage is not included in this report.

Generated reports are intended to provide a high-level graphic summary (where applicable), with the supporting detail below. A user can choose several report options as part of generating a report inclusive of:
  - User defined time period or,
  - For a single day, week, month or another user preference,
  - Selectable flow units to eliminate conversion to another value for comparative results,
  - Display of the data table and alerts.

Reports can be generated within any user defined date range from the previous day or since the controller was activated for a maximum period of 3 years. Generated reports can be exported for printing, storage or incorporation into other documents in PDF or Excel file formats.

To Generate a Report

Generating reports is a simple 1-2-3 step process.

Step 1.   Select Report Type

Select any one of the following reports from the pull-down list. Reports can be generated for a single or multiple controllers. A summary description of each specific report is provided with a small scale depiction of each generated report.

Step 2.   Customize Report Options

In this step a user can select several different options for the report to be generated. These include;

- • Selecting a controller,
- • Selecting a time period or date range,
- • Select flow units (when applicable),
- • Select a chart or table or both
- • Include Alerts as part of the report being generated.

Step 3.   Generate Report

Select the "Run Report" button to generate the selected report and customize. Once a report is generated, it can be exported as an Excel or PDF file format for filing in a project folder or incorporation in a monthly report to a property owner, HOA board or for further analysis.

> ⚠ Note: Any flow report generated while a web session remains open will display flow volumes in the unit value selected. Once the web session is closed, the default value of "Gallons" will reset.

Exporting Reports

Export any report you create to Microsoft Excel® or Adobe PDF® file formats.

To export a report:

Step 1.   Select the file format from the pull-down list in the shaded bar in the middle of the page.

Step 2.   Click the underlined word "Export". If an Excel file format is selected, a new Excel file is opened with all of the data generated from this report. You can change row and column widths or heights as needed, then save the file for your records or later retrieval.

The screen capture below depicts an exported Runtime Log into Excel.

Reports

The following screen captures identify the various reports that can be generated.

This report will display the following information:

- • Day of week
- • Date (within the date range selected)
- • Daily ET corresponding to each day
- • Station Number and associated runtime.

> ⚠ Note: Controllers with start times prior to midnight will display runtime date on the corresponding day.

Single Usage Report
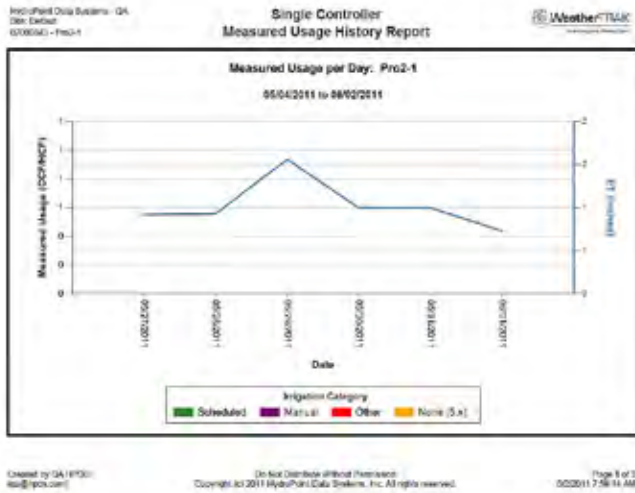
Single Run Time Report
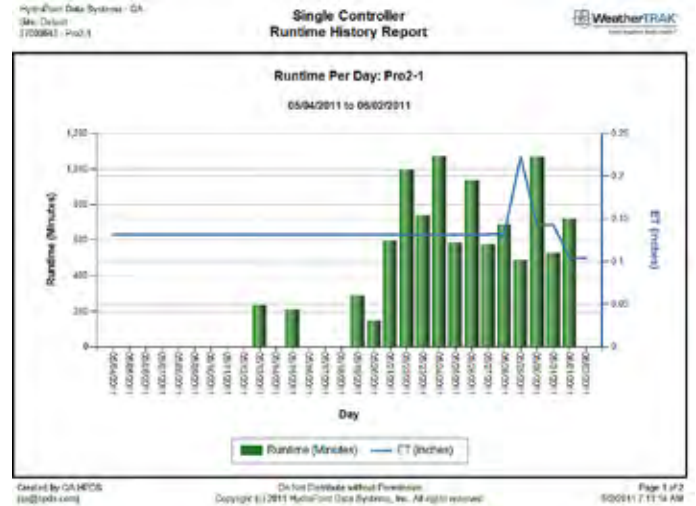
Single Usage Graph

Single Run Time Graph

Report Settings Report

Multi-Alert Reports

Water Budgeting

📖 This page is for sites that have flow sensors and wish to measure actual usage against a water budget or allocation. A summary view of daily usage and accumulated usage (since the last budgeted calculation) is displayed. Water budgeting can be calculated on a daily, weekly, monthly or user-defined time period that may coincide with the local water district's meter reading schedule. Usage can be generated in a user-defined flow value (CCF/HCF, Kgallons or Gallons). Water budgeting can be determined for a single controller or multiple controllers that share a single water source.

⚠ Note: Average daily usage is from 12:00 midnight to 11:59pm. If a controller's start time occurs prior to mid-night, the water usage report for a two-day time frame will provide more accurate usage.

Here's how to compare water usage against an allocated amount. This is useful if you have a site with a single point of connection managed by more than one controller.

1. Deselect all controllers by clicking the "Select All" box on the left hand margin.
2. Select one or more controllers from the list by clicking on an open box. Once selected, the box will fill with a check mark.
3. Select a date range. You may go as far back as when the controller was activated but not more than 3 years.
4. Select flow units from the pull-down list. The choices are:
   • HCF / CCF
   • KGallons
   • Gallons
5. Enter an allocation value in either a whole number or whole number with a decimal value.
6. Press the "Calculate" button to display usage against allocation.

Step 2 - Select Date Range
Step 3 - Select "Update"
Step 4 - Select Flow Value
Step 5 - Enter Allocation
Step 6 - Select "Calculate"
Step 1 - Select a Controller
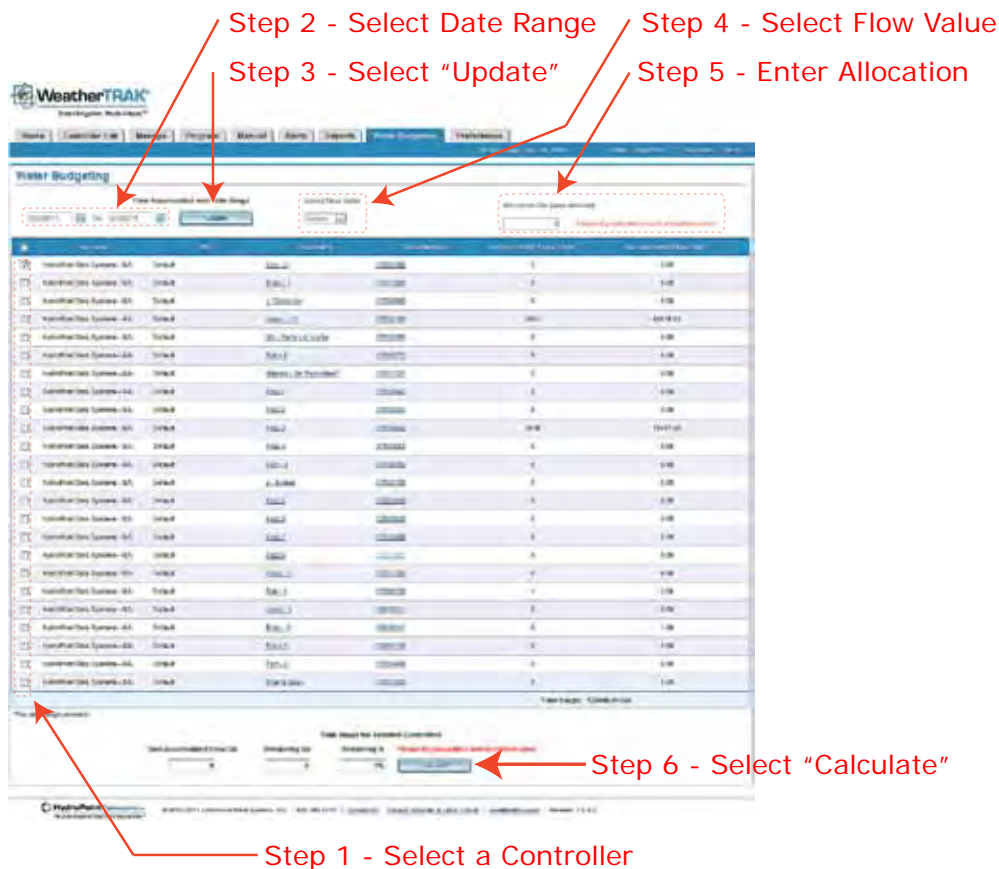
The *ET Pro² Central* allows you to change this value for each controller depending on unit of measure used to deliver water. The web application will remember the selected value from controller to controller even after the web session is closed.

Navigation

Navigation to view a single controller or multiple controllers is accomplished in two different methodologies as follows:

- To select a single controller – scroll the drop-down list and then right click with a mouse,
- To select a block of controllers – move the cursor to the first controller to be selected then hold down the "shift-key" to select a block of controllers.
- To select two or more random controllers – scroll the drop-down list until the first controller to be selected is located, then hold the "Ctrl" key to select one or more controllers as needed.

Viewing Current Alerts

Active alerts are displayed in order of severity with systems alerts displayed at the top. The Active Alerts table displays the following information by controller;

- The date and time the alert occurred,
- The Alert Category,
- The Alert Type,
- The Account the controller is assigned to,
- The Site the where the controller is located,
- The controller name,
- The controller serial number,
- The controller software version,
- A brief description of the Alert,
- An alert duration or how long this alert has persisted in hours, days or months.

← Length of time an active active has existed

Filtering

The Alert page provides a filtering function for faster viewing of critical elements. The page default value is filtering "Off" and alerts are displayed in order of severity with mainline breaks having the highest visibility. Moving the mouse cursor over the "On" radio button will allow the screen to display blank column subheadings as shown in the screen capture below.
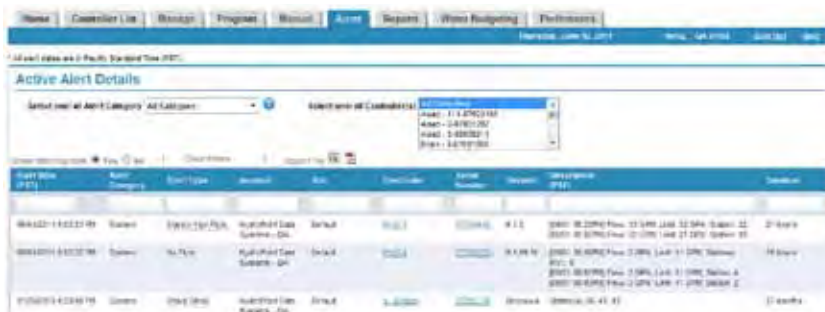
Typing in the filtering requirement in a column heading and selecting "enter" will allow the page to quickly refresh based on a user's sorting preference.

Exporting a Active Alert

The Active Alert page can be exported to either an Excel or PDF file formats. Select the appropriate file format icon and the following screen display will appear. The generated file can be emailed, imported into another file or stored for reference.

Alert Definitions

More detailed alert information can be viewed in one of two ways.

1. Move the mouse cursor over the underlined Alert word and right click. An information box will appear providing an alert definition, possible causes, possible remedies, expected controller behavior and how to clear this specific alert

2. Selecting the icon (this existing sentence is found at the bottom of page 34 in the HELP file . Save this and remaining sentences on this page.

![WeatherTRAK logo]
Smart irrigation. Made simple.™

WeatherTRAK ET Pro2 Central Alerts

WeatherTRAK ET Pro2 Alerts are sent to our WeatherTRAK server in a timely fashion and can always be viewed on the Alerts web page. Users can elect to be notified by email or text message when the alerts are raised and cleared by setting up Alert Notifications on the User Preferences web page.

All alerts indicate that something is wrong and should be investigated. Critical alerts require urgent attention. Major alerts should be investigated promptly.

Alerts are summarized by Alert Category Listed as:

- **System Alerts**
  - Mainline Break (MB)
  - Station High Flow (HF) *
  - No Flow (NF)
  - Leak (LK)
  - Extended Leak (EX) *
  - Valve Short (SH)
  - Valve Over Current (OC) *
  - Valve No Connect (NC)
  - Hardware (HW)
  - System Over Current (SOC) *

- **Communication Alerts**
  - Controller Offline (OFL)
  - No ET Communication (CM)

- **Program Alerts**
  - Water Window (WD)
  - Water Day (DY)

- **Account Alerts**
  - ET Subscription (SB)

- **Irrigation Status Alerts**
  - Controller Off (CO) *
  - System Shutdown (SU) *
  - Controller Paused (CP)
  - Manual Irrigation (MI) *

System Alerts

System Alerts reflect problems with the controller hardware and could affect scheduled irrigation.

Alert Type	Abbr	Severity	Definition / Possible Causes	Controller Action	Possible Remedies	How to Clear
Mainline Break	MB	Critical	Flow has exceeded the Mainline Break Threshold. Possible causes: A mainline break; A broken fitting or fittings; A broken quick coupler.	During controller-initiated irrigation: The controller closes the station valve(s). If the flow remains above the threshold, the Master Valve is closed and irrigation stops. If the flow drops below threshold, irrigation moves to the next station. Outside of controller-initiated irrigation: The Normally Open Master Valve is closed.	Locate and fix break. Locate and replace the broken fitting or quick coupler.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW FLOW STATUS appears. Use the lower knob to change Skip to View. Use the upper knob to enter the status screen. Press the green* button to clear all Flow Alerts. See note below about the automatic clearing of the flow alerts.
Station High Flow *	HF	Major	Flow has exceeded the Station High Flow threshold. Possible causes: A broken sprinkler head; A broken lateral pipe; The Station High Flow threshold (SHFT) is too low.	The controller stops irrigation on the station that was irrigating, raises the Station HF alert on that station and moves to the next station(s) in the scheduled sequence.	Locate and replace the broken sprinkler heads. Repair the broken lateral pipe. Confirm the Station High Flow Threshold setting is correct.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW FLOW STATUS appears. Use the lower knob to change Skip to View. Use the upper knob to enter the status screen. Press the green* button to clear all Flow Alerts. See note below about the automatic clearing of the flow alerts.
No Flow	NF	Major	Flow has dropped below the No Flow threshold. Possible causes: The solenoid plunger not lifting to allow valve to open; The Master Valve not opening if in use; The Pump Start not being activated; A gate valve or isolation valve in the mainline has been closed.	The controller stops irrigation on the station, raises a No Flow Alert on the station and then moves to the next station in the scheduled sequence. If three consecutive stations have No Flow alerts, the controller stops irrigation.	Bleed the corresponding valve manually to determine if water pressure exists. Verify the Pump Start is operating correctly. Locate and open any closed gate valves.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW FLOW STATUS appears. Use the lower knob to change Skip to View. Use the upper knob to enter the status screen. Press the green* button to clear all Flow Alerts. See note below about the automatic clearing of the flow alerts.

Alert	Code	Severity	Description / Possible Causes	Controller Action	Field Action	Clearing Instructions
Leak	LK	Major	Flow has exceeded the Leak Detect threshold for the first leak delay period. Possible causes: • Someone is using a quick coupler or hose bib. • A valve is not closing completely and is leaking. • A mainline fitting has a crack and is leaking. • A mainline pipe has developed a slow leak. • A quick coupler is stuck partially open or a hose bib has been left open.	This is an information-only alert. No action will be taken on the controller.	• Repair any valves, quick couplers or hose bibs. • Prevent the unauthorized use of a quick coupler or hose bib.	At the controller, turn the main menu knob to VIEW FLOW STATUS appears. Use the lower knob to change Skip to View. Use the upper knob to enter the status screen. Press the green* button to clear all Flow Alerts. See note below about the automatic clearing of the flow alerts.
Extended Leak *	EX	Major	Flow has exceeded the Leak Detect threshold continuously for the extended leak period. Possible causes: • Someone is using a quick coupler or hose bib. • A stuck open valve. • A broken mainline fitting.	The controller closes a Normally Open Master Valve and raises an Extended Leak Alert. The next irrigation will start as scheduled but the alert will not be cleared automatically.	• Repair any valves, quick couplers or hose bibs. • Prevent the unauthorized use of a quick coupler or hose bib.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW FLOW STATUS appears. Use the lower knob to change Skip to View. Use the upper knob to enter the status screen. Press the green* button to clear all Flow Alerts. See note below about the automatic clearing of the flow alerts.
Valve Short	SH	Major	The current draw for a single valve solenoid has exceeded 2.0 amps. Possible causes: • A failing solenoid. • A nicked wire is exposed to wet soil. • A broken wire has been exposed to wet soil.	The controller stops irrigation for the specific valve and raises a Valve Short Alert on the valve. If the valve is the Master Valve, all irrigation stops. If it is the Pump Start valve, irrigation stops unless the program has Pump Start Excluded.	• Disconnect the solenoid from the field wire and conduct an Ohm test to see if solenoid is defective. If Ohms reading is less than 10 Ohms replace the solenoid. • Use a wire tracker to locate a field wire splice and replace. • Look for obvious signs of site disruption that could have lead to mechanical damage to a field wire. Replace the field wire.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW VALVE STATUS appears. Use the lower knob to change Skip to View. Turn the upper knob to enter the status screen. Press the green* button to clear all Valve Alerts. See note below about the automatic clearing of valve alerts.
Valve Over Current *	OC	Major	The current draw for a single valve solenoid has exceeded the threshold (500 mA for station or pump start, 800mA for a master valve). Possible causes: • A failing solenoid. • A nicked wire is exposed to wet soil. • Two stations are bridged into one station output and the current draw is too high.	The controller stops irrigation for the specific valve and raises a Valve Over Current Alert on the valve. If the valve is the Master Valve, all irrigation stops. If it is the Pump Start valve, irrigation stops unless the program has Pump Start Excluded.	• Disconnect the solenoid from the field wire and conduct an Ohm test to see if solenoid is defective. If Ohms reading is less than 10 Ohms replace the solenoid. • Use a wire tracker to locate a field wire splice and replace. • Remove one of two bridged stations.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW VALVE STATUS appears. Use the lower knob to change Skip to View. Turn the upper knob to enter the status screen. Press the green* button to clear all Valve Alerts. See note below about the automatic clearing of valve alerts.
Valve No Connect	NC	Major	The current draw for a valve solenoid is below 75 mA. Possible causes: • The number of Max Active Stations exceeds the number of stations physically connected to the controller. • A ribbon cable between station PCBs is partially disconnected or disconnected or station keys are missing. • No field wire is connected to a specific station output. • The field wire terminated in the station output is not making proper contact. • The field wire is broken or there is a corroded or failed splice.	The controller cannot operate this valve and will raise a No Connect Alert on the valve. If the valve is the Normally Closed Master Valve, no irrigation will occur.	• Reduce the number of Max Active stations in the SETUP menu. • Re-insert or repair the ribbon cable and verify sufficient station keys. • If valve solenoids have low current draw, bridge two valves to one station output. • Conduct an Ohm test on a field wire while the solenoid remains disconnected. If Ohm value is higher than 10 Ohms, a field wire or bad splice exists. If Ohm reading on solenoid is greater than 100, replace the solenoid.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW VALVE STATUS appears. Use the lower knob to change Skip to View. Turn the upper knob to enter the status screen. Press the green* button to clear all Valve Alerts. See note below about the automatic clearing of valve alerts.

| Hardware | HW | Major | The controller is not detecting all of the user-defined Max Active Stations.

Possible causes:
• The user-defined Max Active Stations exceeds the number of stations detected by the controller.
• One or more Station Keys are missing or improperly installed.
• The ribbon cable between station input/output boards is defective or connecting pins are bent.
• A station output board has been damaged. | The controller cannot irrigate stations that are not detected. | • Verify Max Active Stations in SETUP menu.
• Confirm ribbon cables are seated properly.
• Verify the number of Station Keys is adequate for the required stations.
• Use another ribbon cable or un-bend the connector pins.
• Look for scorch marks on the board or a strong odor of burnt components. Replace as needed. | Approximately 30 seconds after the situation is remedied, the controller automatically clears this alert. |
| System Over Current | SOC | Major | The current draw for a group of stations has exceeded 2.7 amps or 2700mA.

Probable cause:
Too many stations irrigating at the same time. | The controller automatically reduces the number of valves irrigating, dropping manual irrigation and less-depleted stations first. | Re-program the controller to reduce the number of stations operating at the same time. | To clear the SOC alert at the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW VALVE STATUS appears. Use the lower knob to change Skip to View. Use the upper knob to go to the screen which says SYSTEM OVER-CURRENT. Press the green* button to clear the alert. |

Communication Alerts

Communication Alerts indicate problems exchanging information with the controller.

Alert Type	Abbr	Severity	Definition / Possible Causes	Controller Action	Possible Remedies	How to Clear
Controller Offline	OFL	Major	The controller has not communicated with the WeatherTRAK Central server recently. Possible causes: • Controller power has been turned off. • Two-way phase integrities are low. • 2-way controller set to 1-way in ADVANCED menu.	Unless the power is off, the controller will continue to irrigate as scheduled. However, the controller may not receive ET messages and the controller may no longer be synchronized with the web site.	• Restore AC power if lost. • Verify phase integrities. • Set communication in the ADVANCED menu to 2-way.	Alert will automatically clear when communication is restored.
No ET Communication	CM	Major	ET has not been received for 5 days. Possible causes: • Improper microzone has been assigned to the controller. • ET Subscription has expired.	The controller continues to irrigate all stations using the last received ET message for 5 days. After 5 days the controller will use the backup ET.	• Call HydroPoint Customer Service to verify microzone and ask for a new ET signal to be sent. Confirm ET message is received. • Renew WeatherTRAK ET Everywhere Subscription.	Alert will automatically clear when a new ET message is received.

Program Alerts

Program Alerts indicate that the irrigation scheduling needs modification.

Alert Type	Abbr	Severity	Definition / Possible Causes	Controller Action	Possible Remedies	How to Clear
Water Window	WD	Minor	The user-defined water window is too short for the number of stations assigned. Possible cause: Current weather conditions require runtimes that exceed the length of the water window.	The controller proportionately reduces all station runtimes to fit within the user-defined water window. The landscape may be at risk due to insufficient irrigation.	• Increase the length of the water window in the DAYS/TIMES menu. • Assign some stations to another program.	Re-programming the controller will probably clear the alert.
Water Day	DY	Minor	Some stations are assigned to a program that has too few days of irrigation. Possible cause: Current weather conditions require more frequent irrigation.	The controller continues to irrigate, trying to compensate by extending runtimes where possible. The landscape may be at risk.	• Change the program (DAYS/TIMES menu) to increase the number of water days. • Assign the stations to a program which has more water days.	Re-programming the controller will probably clear the alert.

Account Alerts

Account Alerts indicate that the ET Everywhere subscription has expired.

Alert Type	Abbr	Severity	Definition / Possible Causes	Controller Action	Possible Remedies	How to Clear
ET Subscription	SB	Minor	The WeatherTRAK ET Everywhere Subscription Service has expired.	The controller will continue to irrigate but at 6:00 AM every morning, the Controller will start beeping every 30 seconds.	• Call Customer Service and renew the WeatherTRAK ET Everywhere Subscription. • Change all stations to User No ET	Renewing the service will clear the alert

Irrigation Status Alerts

Irrigation Status Events indicate that the controller is Off, Shutdown, Paused, or in Manual Irrigat

Alert Type	Abbr	Severity	Definition / Possible Causes	Controller Action	Possible Remedies	How to Clear
Controller Off [1]	CO	Low	A user has turned off all irrigation. This was done by turning the main function knob to "OFF". Possible Causes • Controller has been turned off for repairs, pesticide/insecticide application or special event. • Controller has been turned off for winterization.	The controller stops all scheduled irrigation indefinitely but leaves it a a normally open master valve in the "open" or default position. The controller will continue to receive daily ET's and calculate station specific depletion.	Not applicable	Turn the main menu knob from the "OFF" to "RUN" position.
System Shutdown [1]	SD	Low	A user has turned off all irrigation. This was done by turning the main function knob to "OFF". Possible Reason • A catastrophic event has occurred where a user needed to ensure that the master valve is closed.	The controller stops all scheduled irrigation indefinitely and closes a normally open master valve. The controller will continue to receive daily ET's and calculate station specific depletion.	Not applicable	Take the controller out of the "System Shutdown" mode from the OFF menu by pressing the [1] button and turning the main menu knob to "RUN".
Controller Paused	CP	Low	The controller's irrigation is paused either by a rain pause or rain switch. Some stations may still irrigate if the station's useable rainfall setting is none. Possible Causes • A rain pause has been set at the controller or from WeatherTRAK.net central • A rain pause was automatically set by WeatherTRAK's Climate Center • A rain sensor has been activated. [1] • A rain sensor has failed open (no rain has occurred). [1]	The controller stops all scheduled irrigation (except stations with useable rainfall set to none) and stops calculating depletion on paused stations until the rain pause duration has expired.	None, if it has recently rained, this is expected controller behavior. If it has not rained and the pause was generated by a rain switch, the rain switch should be checked.	Set rain pause duration to 0 days on the controller or from WeatherTRAK.net. Bypass the rain switch.
Manual Irrigation [1]	MI	Low	The controller is currently manually irrigating. To determine which station, go to the MANUAL page and view "Controller Operating Status" from WeatherTRAK.net. Possible Causes • A user has started manual irrigation on a single station, multiple or all stations, from the controller or from the WeatherTRAK.net central.	The controller will run all manual station setup for manual irrigation program. The controller can support both scheduled and manual irrigation at the same time.	Not applicable	This event will automatically clear when manual irrigation program is complete. The manual irrigation program can be stopped immediately from the controller or WeatherTRAK.net

[1] These alerts are only available on the controllers with 6.0 or greater software.

Notes about the automatic clearing of Flow Alerts

- In 5.0 and 5.6 controllers, flow alerts are cleared automatically at the Program A start time.
- In 6.0+ controllers, Flow Alert Clearing can be set to Auto or Manual on the controller.
  - If Flow Alert Clearing is set to Auto, the Flow Alerts, except the Extended Leak Alert, are cleared automatically at the Program A start time.
  - If Flow Alert Clearing is set to Manual, the Flow Alerts, except for the Leak Detect Alert, must be cleared by the user.
  - Automatic Leak Alert Clearing. The Extended Leak Alert will not be cleared automatically at Program A start time, but will be retested after irrigation and may be cleared at that time. The Leak Detect Alert always clears automatically at Program A start time.
- To clear Flow Alerts at the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW FLOW STATUS appears. Press the green* button to clear all Flow Alerts.

Notes about Valve Alerts

- Valve Alerts are only reported if the RTVT is set to On, Setup Menu on the controller, Program Page Setup Panel on the web. In 5.6 and 6.0+ controllers, a valve test is always run at Program A start time.
- To clear Valve Alerts at the controller, turn the center knob to ALERTS. Turn the upper knob clockwise until VIEW VALVE STATUS appears. Use the lower knob to change Skip to View. Turn the upper knob to enter status screen. Press green* button.
- To clear the SOC alert at the controller, turn the center knob to ALERTS. Turn the upper knob clockwise until VIEW VALVE STATUS appears. Use the lower knob to change Skip to View. Turn the upper knob to the screen at the end which says SYSTEM OVER CURRENT. Press green* button.

The Alerts page now displays additional information identifying the method of communication for remote alert notification with a time and date stamp of when the message was received by the server. The "Alert Type" is underlined indicating that a mouse roll-over and right click will expose a definition of the alert, possible causes, possible remedies and controller behavior that corresponds with the alert type selected. See the screen display below of an example of an Alert Type pop-up. A similar message is sent with the type of communication, including a time and date stamp when an alert is "cleared" in the field or by making programming changes (depending on the type of alert). The time for this Alerts page is always reflected in Pacific Standard Time (PST) no matter what time zone the user may log onto.

⚠ Note: Once an alert is cleared, it will become part of an Alert Report with time and date stamps for each alert that has occurred. Alert reports are stored for a period of up to 3 years or more and can be retrieved by alert type, controller and/or date range.

⚠ Note: Some Alert Types have a water drop icon to the right of the Alert type. The icon or symbol indicates this feature is only available on controllers with v6.0 software.

⚠ Note: Once an alert is triggered, it must be cleared or resolved for the controller to resume irrigation for a particular station. Different Alerts can be "cleared" in various manners. The following table provides various methods to clear an alert.

⚠ Note: Flow, Valve, Communication, Subscription and Hardware Alerts cannot be cleared from the Web Application. Flow and Valve alerts can only be cleared from the Controller, once the field issue has been addressed.

Please note there are two kinds of Water Window Alerts;

1. The first Water Window Alert will occur during scheduled irrigation when the calculated station run times exceed the user defined water window. This type of alert will be sent at the start of the water window for a specific program but will clear automatically at the end of scheduled irrigation.
2. The second Water Window Alert will occur when an inadequate water window is selected for the number of assigned stations. For example a 3 hour water window alert is selected for 10 stations using low precipitation rate rotors or stations with a accumulated run times that exceed this duration. This alert will be typically raised when;
   - the controller receives updated or daily ET messages or,
   - the date changes to a new month which also represents a new Kc value or,
   - user changes are made that causes a water window conflict.

This Alert will not clear until the Water Window is increased or fewer stations are assigned to this window to resolve the programming conflict.

Viewing Cleared Alerts

Once an Alert is cleared, it will be stored in the Alerts Log. Logs provide a record of past activity, and therefore are view-only. Records are maintained for up to 3 years or from the controller activation date.

For help in clearing Alerts, contact *WeatherTRAK* Customer Service at (800) 362-8774.

Preferences

📖 This new page provides confirmation of your personal contact information for this account as well as selection of personal preferences for remote alert notification via email or text messages to a cell phone. The following paragraphs provide additional details of the features and functions of this page.

Navigation

Navigation within this page is similar to the PROGRAM page allowing one or more sections to be opened and collapsed based on need. The page will initially open in the "Expand All" mode and hyperlinks at the top of the page provide access to individual sections within the page. The Page has "persistence" meaning it will remember the state in which it was left from one web session to another. Contextual Help functions have been added to this page specific for all Alert types. Each alert type has a dashed underline that will display a pop-up box with a mouse roll-over and right click. This will provide a severity of an alert, definition/possible cause, possible remedies and controller behavior for the corresponding alert selected.

⚠️ Note: Some Alert Types have a water drop icon to the right of the Alert type. The icon or symbol indicates this feature is only available on controllers with v6.0 software.

Expand or Collaspe Page Sections

List of Major Cell Phone Providers

Alert Definitions
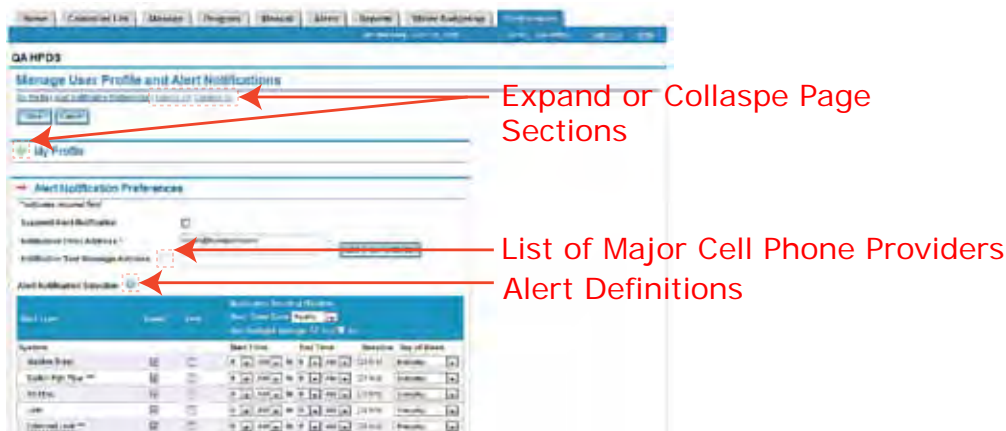
Another method of navigation is to use the right-hand page bar to move up and down within a section or within the page.

⚠️ Note: Remember to select the "Save" button if new data or changes have been made before leaving the page or closing the web session to avoid loss of data. Selecting cancel will return the page back to the last "saved" state.

My Profile

In this section personal account information is entered and verified. This is inclusive of your email address (personal login), primary and mobile phone numbers. Entering your cell phone number is required **when** remote alert notifications are to be sent as a text message. This section will automatically provide you a time and date stamp of when it was last updated.

Alert Notification Preferences

This section allows selection of personal preferences for remote alert notification of one or more field alerts at your discretion. Choose from any one of the following functions.

1. Temporary suspension of receiving email and text messages.
2. Select to have remote alert notification automatically change using daylight savings for your time zone
3. Select the type of remote alert notification preference (email or text messaging)
4. Times of day to be notified
5. Day of week to be notified
6. Displays controllers in your account which can be excluded from remote alert notification as needed.

⚠ Note: Personal cell phone service providers may charge for receiving alert text messages. Consider reviewing your service plan as part of this setup.

Select button to send a test message

Select icon to select type of notification
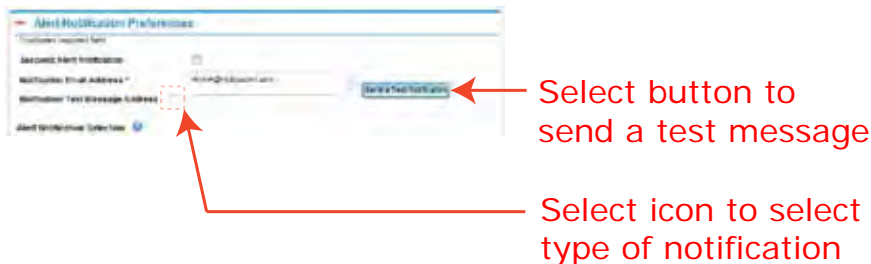
The default is all values are disabled until personal selections are made.

- Suspend Alert Notification – This feature is intended to be used to suspend receiving messages for vacations or some other reason. Checking the open box will "gray-out" all remaining sections and will suspend any remote alert notification emails or text messages indefinitely until the value is changed back to "unchecked". This feature changes this notification for the specific user only and does not impact others accessing the same controllers with a different, secure email and password.
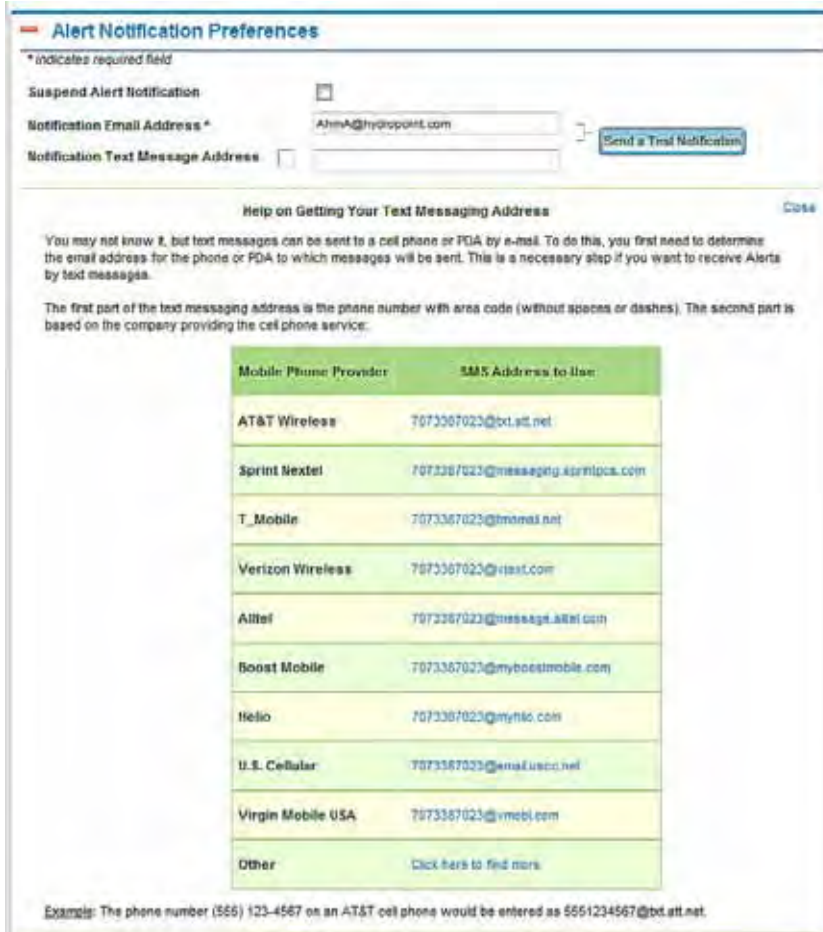
When the Suspend Alert Notification checkbox is selected, the Alert Notification setup will be grayed back and the following warning will appear.

Select "OK" to acknowledge the warning or select the to cancel this operation.
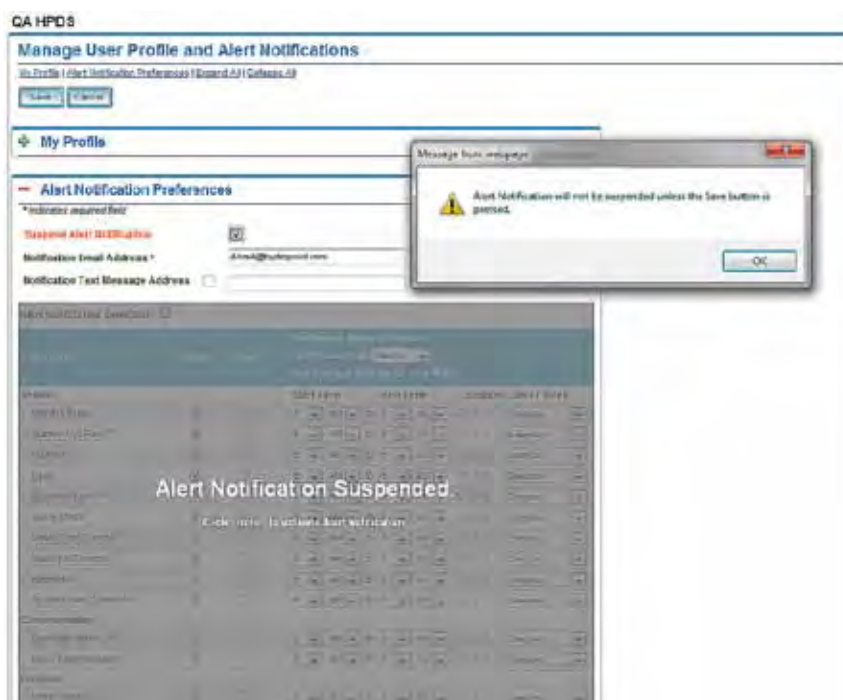
- Notification Email Address – Enter your work or personal email address to receive remote alert notifications.
- Notification Text Message Address – Enter your cell phone carrier's text message address to receive text messages. Selecting the 🔵 link will display the top 10 cell phone carrier default message prefixes. Select "Send a Test Notification" once either email or text message addresses are entered to confirm receipt of a sample alert message.

- Time Zone – Select the time zone in which you're located so that alerts are received during the same hours of notification selected.
- Send a Test Notification – Once this initial information is setup and saved, this feature will enable a test email and text message be sent to the identified email address or cell phone.

Alerts Types / Definitions / Action

Selecting and clicking the 🔵 symbol will open up a new page that provides a hierarchy of the controller alerts, definitions of each alert and how the controller responds to each alert independently. Consider printing this page from this HELP file for future reference or to provide to others in the field to better understand how the controller responds to specific alerts.

WeatherTRAK ET Pro2 Central Alerts

WeatherTRAK ET Pro2 Alerts are sent to our WeatherTRAK server in a timely fashion and can always be viewed on the Alerts web page. Users can elect to be notified by email or text message when the alerts are raised and cleared by setting up Alert Notifications on the User Preferences web page.

All alerts indicate that something is wrong and should be investigated. Critical alerts require urgent attention. Major alerts should be investigated promptly.

Alerts are summarized by Alert Category Listed as:

- **System Alerts**
  - Mainline Break (MB)
  - Station High Flow (HF) *
  - No Flow (NF)
  - Leak (LK)
  - Extended Leak (EX) *
  - Valve Short (SH)
  - Valve Over Current (OC) *
  - Valve No Connect (NC)
  - Hardware (HW)
  - System Over Current (SOC) *

- **Communication Alerts**
  - Controller Offline (OFL)
  - No ET Communication (CM)

- **Program Alerts**
  - Water Window (WD)
  - Water Day (DY)

- **Account Alerts**
  - ET Subscription (SB)

- **Irrigation Status Alerts**
  - Controller Off (CO) *
  - System Shutdown (SU) *
  - Controller Paused (CP)
  - Manual Irrigation (MI) *

System Alerts

System Alerts reflect problems with the controller hardware and could affect scheduled irrigation.

Alert Type	Abbr	Severity	Definition / Possible Causes	Controller Action	Possible Remedies	How to Clear
Mainline Break	MB	Critical	Flow has exceeded the Mainline Break Threshold. Possible causes: • A mainline break. • A broken fitting or fittings. • A broken quick coupler.	During controller-initiated irrigation: The controller closes the station valve(s). If the flow remains above the threshold, the Master Valve is closed and irrigation stops. If the flow drops below the threshold, irrigation moves to the next station. Outside of controller-initiated irrigation: The Normally Open Master Valve is closed.	• Locate and fix break. • Locate and replace the broken fitting or quick coupler.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW FLOW STATUS appears. Use the lower knob to change Skip to View. Use the upper knob to enter the status screen. Press the green* button to clear all Flow Alerts. See note below about the automatic clearing of the flow alerts.
Station High Flow *	HF	Major	Flow has exceeded the Station High Flow threshold. Possible causes: • A broken sprinkler head. • A broken lateral pipe. • The Station High Flow threshold (SHFT) is too low.	The controller stops irrigation on the station that was irrigating, raises the Station HF alert on that station and moves to the next station(s) in the scheduled sequence.	• Locate and replace the broken sprinkler heads. • Repair the broken lateral pipe. • Confirm the Station High Flow Threshold setting is correct.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW FLOW STATUS appears. Use the lower knob to change Skip to View. Use the upper knob to enter the status screen. Press the green* button to clear all Flow Alerts. See note below about the automatic clearing of the flow alerts.
No Flow	NF	Major	Flow has dropped below the No Flow threshold. Possible causes: • The solenoid plunger not lifting to allow valve to open. • The Master Valve not opening if in use. • The Pump Start not being activated. • A gate valve or isolation valve in the mainline has been closed.	The controller stops irrigation on the station, raises a No Flow Alert on the station and then moves to the next station in the scheduled sequence. If three consecutive stations have No Flow alerts, the controller stops irrigation.	• Bleed the corresponding valve manually to determine if water pressure exists. • Verify the Pump Start is operating correctly. • Locate and open any closed gate valves.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW FLOW STATUS appears. Use the lower knob to change Skip to View. Use the upper knob to enter the status screen. Press the green* button to clear all Flow Alerts. See note below about the automatic clearing of the flow alerts.

Alert	Code	Severity	Description / Possible Causes	Controller Action	Corrective Action	Clearing the Alert
Leak	LK	Major	Flow has exceeded the Leak Detect threshold for the first leak delay period. Possible causes: • Someone is using a quick coupler or hose bib. • A valve is not closing completely and is leaking. • A mainline fitting has a crack and is leaking. • A mainline pipe has developed a slow leak. • A quick coupler is stuck partially open or a hose bib has been left open.	This is an information-only alert. No action will be taken on the controller.	• Repair any valves, quick couplers or hose bibs. • Prevent the unauthorized use of a quick coupler or hose bib.	At the controller, turn the main menu knob to VIEW FLOW STATUS appears. Use the lower knob to change Skip to View. Use the upper knob to enter the status screen. Press the green* button to clear all Flow Alerts. See note below about the automatic clearing of the flow alerts.
Extended Leak *	EX	Major	Flow has exceeded the Leak Detect threshold continuously for the extended leak period. Possible causes: • Someone is using a quick coupler or hose bib. • A stuck open valve. • A broken mainline fitting.	The controller closes a Normally Open Master Valve and raises an Extended Leak Alert. The next irrigation will start as scheduled but the alert will not be cleared automatically.	• Repair any valves, quick couplers or hose bibs. • Prevent the unauthorized use of a quick coupler or hose bib.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW FLOW STATUS appears. Use the lower knob to change Skip to View. Use the upper knob to enter the status screen. Press the green* button to clear all Flow Alerts. See note below about the automatic clearing of the flow alerts.
Valve Short	SH	Major	The current draw for a single valve solenoid has exceeded 2.0 amps. Possible causes: • A failing solenoid. • A nicked wire is exposed to wet soil. • A broken wire has been exposed to wet soil.	The controller stops irrigation for the specific valve and raises a Valve Short Alert on the valve. If the valve is the Master Valve, all irrigation stops. If it is the Pump Start valve, irrigation stops unless the program has Pump Start Excluded.	• Disconnect the solenoid from the field wire and conduct an Ohm test to see if solenoid is defective. If Ohm reading is less than 10 Ohms replace the solenoid. • Use a wire tracker to locate a field wire splice and replace. • Look for obvious signs of site disruption that could have lead to mechanical damage to a field wire. Replace the field wire.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW VALVE STATUS appears. Use the lower knob to change Skip to View. Turn the upper knob to enter the status screen. Press the green* button to clear all Valve Alerts. See note below about the automatic clearing of valve alerts.
Valve Over Current *	OC	Major	The current draw for a single valve solenoid has exceeded the threshold (500 mA for station or pump start, 800mA for a master valve). Possible causes: • A failing solenoid. • A nicked wire is exposed to wet soil. • Two stations are bridged into one station output and the current draw is too high.	The controller stops irrigation for the specific valve and raises a Valve Over Current Alert on the valve. If the valve is the Master Valve, all irrigation stops. If it is the Pump Start valve, irrigation stops unless the program has Pump Start Excluded.	• Disconnect the solenoid from the field wire and conduct an Ohm test to see if solenoid is defective. If Ohm reading is less than 10 Ohms replace the solenoid. • Use a wire tracker to locate a field wire splice and replace. • Remove one of two bridged stations.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW VALVE STATUS appears. Use the lower knob to change Skip to View. Turn the upper knob to enter the status screen. Press the green* button to clear all Valve Alerts. See note below about the automatic clearing of valve alerts.
Valve No Connect	NC	Major	The current draw for a valve solenoid is below 75 mA. Possible causes: • The number of Max Active Stations exceeds the number of stations physically connected to the controller. • A ribbon cable between station PCBs is partially disconnected or station keys are missing. • No field wire is connected to a specific station output. • The field wire terminated in the station output is not making proper contact. • The field wire is broken or there is a corroded or failed splice.	The controller cannot operate this valve and will raise a No Connect Alert on the valve. If the valve is the Normally Closed Master Valve, no irrigation will occur.	• Reduce the number of Max Active stations in the SETUP menu. • Re-insert or repair the ribbon cable and verify sufficient station keys. • If valve solenoids have low current draw, bridge two valves to one station output. • Conduct an Ohm test on a field wire while the solenoid remains disconnected. If Ohm value is higher that 10 Ohms, a field wire or bad splice exists. If Ohm reading on solenoid is greater than 100, replace the solenoid.	At the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW VALVE STATUS appears. Use the lower knob to change Skip to View. Turn the upper knob to enter the status screen. Press the green* button to clear all Valve Alerts. See note below about the automatic clearing of valve alerts.

| Hardware | HW | Major | The controller is not detecting all of the user-defined Max Active Stations.

Possible causes:
• The user-defined Max Active Stations exceeds the number of stations detected by the controller.
• One or more Station Keys are missing or improperly installed.
• The ribbon cable between station input/output boards is defective or connecting pins are bent.
• A station output board has been damaged. | The controller cannot irrigate stations that are not detected. | • Verify Max Active Stations in SETUP menu.
• Confirm ribbon cables are sealed properly.
• Verify the number of Station Keys is adequate for the required stations.
• Use another ribbon cable or un-bend the connector pins.
• Look for scorch marks on the board or a strong odor of burnt components. Replace as needed. | Approximately 30 seconds after the situation is remedied, the controller automatically clears this alert. |
| System Over Current [1] | SOC | Major | The current draw for a group of stations has exceeded 2.7 amps or 2700mA.

Probable cause:
Too many stations irrigating at the same time. | The controller automatically reduces the number of valves irrigating, dropping manual irrigation and less-depleted stations first. | Re-program the controller to reduce the number of stations operating at the same time. | To clear the SOC alert at the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW VALVE STATUS appears. Use the lower knob to change Skip to View. Use the upper knob to go to the screen which says SYSTEM OVER-CURRENT. Press the green* button to clear the alert. |

Communication Alerts

Communication Alerts indicate problems exchanging information with the controller.

Alert Type	Abbr	Severity	Definition / Possible Causes	Controller Action	Possible Remedies	How to Clear
Controller Offline	OFL	Major	The controller has not communicated with the WeatherTRAK Central server recently. Possible causes: • Controller power has been turned off. • Two-way phase integrities are low. • 2-way controller set to 1-way in ADVANCED menu.	Unless the power is off, the controller will continue to irrigate as scheduled. However, the controller may not receive ET messages and the controller may no longer be synchronized with the web site.	• Restore AC power if lost. • Verify phase integrities. • Set communication in the ADVANCED menu to 2-way.	Alert will automatically clear when communication is restored.
No ET Communication	CM	Major	ET has not been received for 5 days. Possible causes: • Improper microzone has been assigned to the controller. • ET Subscription has expired.	The controller continues to irrigate all stations using the last received ET message for 5 days. After 5 days the controller will use the backup ET.	• Call HydroPoint Customer Service to verify microzone and ask for a new ET signal to be sent. Confirm ET message is received. • Renew WeatherTRAK ET Everywhere Subscription.	Alert will automatically clear when a new ET message is received.

Program Alerts

Program Alerts indicate that the irrigation scheduling needs modification.

Alert Type	Abbr	Severity	Definition / Possible Causes	Controller Action	Possible Remedies	How to Clear
Water Window	WD	Minor	The user-defined water window is too short for the number of stations assigned. Possible cause: Current weather conditions require runtimes that exceed the length of the water window.	The controller proportionately reduces all station runtimes to fit within the user-defined water window. The landscape may be at risk due to insufficient irrigation.	• Increase the length of the water window in the DAYS/TIMES menu. • Assign some stations to another program.	Re-programming the controller will probably clear the alert.
Water Day	DY	Minor	Some stations are assigned to a program that has too few days of irrigation. Possible cause: Current weather conditions require more frequent irrigation.	The controller continues to irrigate, trying to compensate by extending runtimes where possible. The landscape may be at risk.	• Change the program (DAYS/TIMES menu) to increase the number of water days. • Assign the stations to a program which has more water days.	Re-programming the controller will probably clear the alert.

Account Alerts

Account Alerts indicate that the ET Everywhere subscription has expired.

Alert Type	Abbr'	Severity	Definition / Possible Causes	Controller Action	Possible Remedies	How to Clear
ET Subscription	SB	Minor	The WeatherTRAK ET Everywhere Subscription Service has expired.	The controller will continue to irrigate but at 8:00 AM every morning, the Controller will start beeping every 30 seconds.	• Call Customer Service and renew the WeatherTRAK ET Everywhere Subscription. • Change all stations to User No ET	Renewing the service will clear the alert.

Irrigation Status Alerts

Irrigation Status Events indicate that the controller is Off, Shutdown, Paused, or in Manual Irrigat

Alert Type	Abbr	Severity	Definition / Possible Causes	Controller Action	Possible Remedies	How to Clear
Controller Off †	CO	Low	A user has turned off all irrigation. This was done by turning the main function knob to "OFF". Possible Causes • Controller has been turned off for repairs, pesticide/insecticide application or special event. • Controller has been turned off for winterization.	The controller stops all scheduled irrigation indefinitely but leaves is a normally open master valve in the "open" or default position. The controller will continue to receive daily ET's and calculate station specific depletion.	Not applicable	Turn the main menu knob from the "OFF" to "RUN" position.
System Shutdown †	SD	Low	A user has turned off all irrigation. This was done by turning the main function knob to "OFF". Possible Reason • A catastrophic event has occurred where a user needed to ensure that the master valve is closed.	The controller stops all scheduled irrigation indefinitely and closes a normally open master valve. The controller will continue to receive daily ET's and calculate station specific depletion	Not applicable	Take the controller out of the "System Shutdown" mode from the OFF menu by pressing the † button and turning the main menu knob to "RUN".
Controller Paused	CP	Low	The controller's irrigation is paused either by a rain pause or rain switch. Some stations may still irrigate if the station's useable rainfall setting is none. Possible Causes • A rain pause has been set at the controller or from WeatherTRAK.net central. • A rain pause was automatically set by WeatherTRAK's Climate Center • A rain sensor has been activated. * • A rain sensor has failed open (no rain has occurred). *	The controller stops all scheduled irrigation (except stations with useable rainfall set to none) and stops calculating depletion on paused stations until the rain pause duration has expired.	None. If it has recently rained, this is expected controller behavior. If it has not rained and the pause was generated by a rain switch, the rain switch should be checked.	Set rain pause duration to 0 days on the controller or from WeatherTRAK.net. Bypass the rain switch.
Manual Irrigation *	MI	Low	The controller is currently manually irrigating. To determine which station, go to the MANUAL page and view "Controller Operating Status" from WeatherTRAK.net. Possible Causes: • A user has started manual irrigation on a single station, multiple or all stations from the controller or from the WeatherTRAK.net central.	The controller will run all manual station setup for manual irrigation program. The controller can support both scheduled and manual irrigation at the same time.	Not applicable	This event will automatically clear when manual irrigation program is complete. The manual irrigation program can be stopped immediately from the controller or WeatherTRAK.net

These alerts are only available on the controllers with 6.0 or greater software.

Notes about the automatic clearing of Flow Alerts

- In 5.0 and 5.6 controllers, flow alerts are cleared automatically at the Program A start time.
- In 6.0+ controllers, Flow Alert Clearing can be set to Auto or Manual on the controller.
  - If Flow Alert Clearing is set to Auto, the Flow Alerts, except the Extended Leak Alert, are cleared automatically at the Program A start time.
  - If Flow Alert Clearing is set to Manual, the Flow Alerts, except for the Leak Detect Alert, must be cleared by the user.
  - Automatic Leak Alert Clearing: The Extended Leak Alert will not be cleared automatically at Program A start time, but will be retested after irrigation and may be cleared at that time. The Leak Detect Alert always clears automatically at Program A start time.
- To clear Flow Alerts at the controller, turn the main menu knob to ALERTS. Turn the upper knob clockwise until VIEW FLOW STATUS appears. Press the green* button to clear all Flow Alerts.

Notes about Valve Alerts

- Valve Alerts are only reported if the RTVT is set to On, Setup Menu on the controller, Program Page Setup Panel on the web. In 5.6 and 6.0+ controllers, a valve test is always run at Program A start time
- To clear Valve Alerts at the controller, turn the center knob to ALERTS. Turn the upper knob clockwise until VIEW VALVE STATUS appears. Use the lower knob to change Skip to View. Turn the upper knob to enter status screen. Press green* button.
- To clear the SOC alert at the controller, turn the center knob to ALERTS. Turn the upper knob clockwise until VIEW VALVE STATUS appears. Use the lower knob to change Skip to View. Turn the upper knob to the screen at the end which says SYSTEM OVER-CURRENT. Press green* button.

Alert Types

In this section, selection of the User's time zone, use of automatic daylight savings, alert type for remote notification, hours of notification and days of week provide a wide range of flexibility based on personal preferences. These can be modified as needed depending on seasonal or personal requirements.

- Notification Sending Windows – This allows a user to select their respective time zone specific to when remote alert messages are to be sent or received. In some limited cases, there could be up to 12 hour delay in receiving a remote alert message depending on remote alert start and end times selected vs. irrigation start times and water windows.

⚠ Note: All posted alerts in the Reports and Alert pages reflect Pacific Standard Time (PST)

- Alert Category / Type – Alerts are grouped into categories reflecting a hierarchy of impacts to daily irrigation and controller response. For example, System Alerts are any alerts that may impact scheduled irrigation from occurring. Ignoring them could cause landscape stress from lack of adequate watering. By contrast, a Program Alert is notifying you that program changes are necessary to ensure all stations are receiving sufficient watering. A mouse roll-over and hold on any of the Alert types will provide a definition for each alert type to avoid having to open a second page.

- Communication Type – Email and text messages to a cell phone are now in addition to posted alerts at the controller and on www.weathertrak.net.   Check one or both communication types depending on your personal preference. These can be changed at any time as seasonal changes dictate alert notification and response times.
- Start Time / End Time / Duration - Select the time of day to receive remote alerts. Selecting 6:00am to 6:00am represents 24 hrs. The duration of the start and end time selected is automatically displayed for each alert in the "Duration" column.
- Days of Week – Select the days of week in which you wish to receive remote alert notification. The choices are:
  - Everyday
  - Monday-Friday
  - Monday-Saturday
  - Weekends (Saturday and Sunday only)

Be sure and set the Start Time, Stop Time and Days of Week properly to ensure receipt of alerts when needed.

Controller Selection

This portion of the Preference Page will list in alphabetic order all of the controllers accessible in your account with the default value of all displayed with a filled check box. A single or multi controllers can be excluded from alert notification for any number of reasons – again based on personal preferences. These settings will persist between web sessions until manually changed.
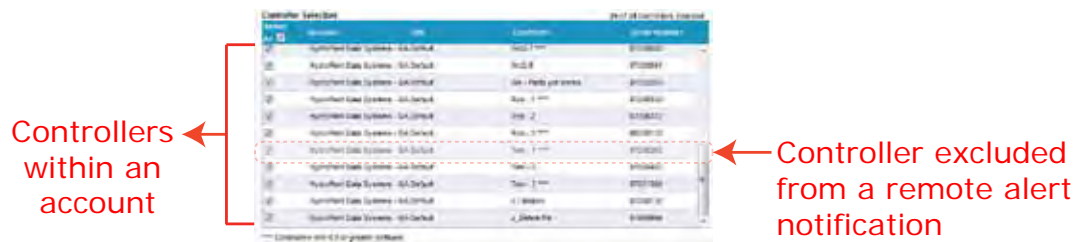
Save / Cancel

Once personal preferences have been selected but before navigating to another page, select "Save" to preserve these settings.

If you don't wish to save any entered data, select Cancel and the page will revert back to either the default settings or to the last time "Save" settings.

How to Receive Remote Alert Messages

The following step-by-step procedure represents an example of how to setup remote alert notification preferences:

Step 1.   Confirm or edit the email address or cell phone number in "Profile" section first. Select the "Save" button to store this data.

Step 2.   "Send a Test Notification" message to confirm messages can be received. A pop-up message will appear within 5-10 seconds once this message has cleared the *WeatherTRAK* server queue. The time length to receive a test message will vary from provider to provider.

Step 3.   Select your specific time zone. The default setting is automatic adjustment for Daylight Savings. Next select the alert type, communication method (email or text message), start time / end time and days of week of when remote alert messages are to be received.

⚠ Note: If start time / end time are selected outside of scheduled irrigation, then remote messages will be received as soon as the "Start Time" begins.

⚠ Note: If the water day mode is selected to be Monday -Friday and irrigation is scheduled to begin on Friday night but continues into Saturday morning and an alert occurs, a remote alert message will not be received until Monday morning. Consider changing the number of days of alert notification per week to receive messages based on personal preferences.

View the list of all of the controllers within your account. Select individual controllers to be excluded from alert notification based on personal preferences, simply by checking the box adjacent to the corresponding controller. To include a controller, simply re-select the check box to remove the check mark.

Step 4.   Select the "Save" button to preserve all of your personal preferences for the entire page.

⚠ Note: Failure to "Save" any changes before navigating to another page will cause your selections to be lost.

Step 1
Confirm "My Profile"
data is correct

Step 2
Set up Alert Notification &
send a test page

Step 3
Select Alert Notification
Preferences

Step 4
Exclude any controllers
from alert notifications

Step 5
Save changes

Troubleshooting

The following troubleshooting tips are to help you resolve common web questions. For more help call *WeatherTRAK* Customer Service toll-free at (800) 362-8774.

1. *I've clicked the Update Schedule button on the Manage page, but the date and time stamp hasn't changed.*

    An update usually takes about 2-3 minutes depending on the number of stations. After about 3 minutes have passed, click the Refresh button in your browser window. Don't see the Refresh button? Press the F5 function key on your computer keyboard. The updated time and date stamp should appear.

2. *I am on the Manage page, and I want to view each station's landscape attributes. How do I do this?*

    To the right of the controller name are three Quick Reports. Click the Settings link. Keep both browser windows open and toggle between the two to compare data.

3. *How do I view irrigation run times for today?*

    To view today's irrigation, generate a RunTime Usage Report that includes today's date. Note: to quickly view irrigation for the last 30 days, go to the Controller List tab, select a controller, and then click the 30 days Runtime Quick Report.

4. *I just opened the Manual page and I still see selected stations and run times.*

    After manual irrigation has completed, the stations you selected to water continue to display along with their run order and run times. This makes it easy for you to repeat the same process or simply clear the runtime order and run times and select different stations as needed.

5. *The Home page shows a Major Issue for a specific controller. How can I quickly view this particular alert?*

    Click the controller text link to go directly to the Alerts page for the selected controller. Here, you'll see additional information about the alert.

6. *A controller on the Controller List Page is displayed as "Offline". What can I do to re-establish communication?*

    This may be a temporary condition if the online service provider is undergoing maintenance. The controller may revert to Online status automatically. However, if this condition persists after several minutes, contact *WeatherTRAK* Customer Service at (800) 362-8774.

Definitions

- Controller Online/Offline. Indicates the status of communication between the website and a controller-
- Lock. Indicates that the user is "locked-out" from using the controller during an upload of programming information to the website. All screens are view-only during this 2-3 minute period-
- Queue. A temporary storage for any changes made using the website that are pending while changes are being made at the controller level in the field. After controller changes are made in the field and access to the controller is restored to the website, changes are released from the queue and downloaded to the controller.
- Upload. The transmission that occurs when a controller's programming information is sent from the field to the secure *WeatherTRAK* server-
- *WeatherTRAK* Server. The secure storage site where all *ET Pro² Central* data is stored. Data is backed up routinely to ensure integrity-

WeatherTRAK Customer Service

Help is just a phone call or mouse click away.

WeatherTRAK Customer Service representatives are ready to answer your questions. Our English-speaking and Spanish-speaking team is available Monday through Friday, from 7:00 am to 6:00 pm, and Saturday, from 9:00 am to 2:00pm, Pacific Time.

(800) 362-8774

support@hydropoint.com

www.weathertrak.com/support

Your feedback makes us better. Please send suggestions to products@hydropoint.com.

Notes

Appendix A: Typical Soil Types

Introduction

This document is intended to provide a high-level overview of understanding and identifying a site's soil type as one of several variables that will ensure accurate water application and will maintain plant health.

What is the Significance of Understanding Soil Texture for Irrigation?

Properly spaced sprinkler heads will discharge water in a measureable value called "precipitation rate" or the amount of water applied in inches per hour. Different sprinkler types have different precipitation rates that may not always be matched to the soils infiltration rate or ability to absorb water. Applying water too fast in a sandy soil could drive the water past the root zone where supplemental irrigation is ineffective. The same principle of applying water too fast in a clay soil with a slow infiltration rate may cause irrigation run-off and waste water.

Identifying the soil type as part of site and environmental elements with your *WeatherTRAK* controller will enable the controller to integrate soil and irrigation science. When entered into the controller, it will automatically determine the number of irrigation cycles and periods or "soak-time" between cycles. The purpose of multiple cycle and soak times is to hold water in the selected root zone depth or (default value if satisfactory) for the corresponding plant type. This root depth setting can be slowly increased as plants established and plant maturity increases.

Most western soils are commonly a mixture of clay loam, or sandy clay, and are not strictly clay. Its important to recognize that plant intake of water and nutrients is somewhat difficult in clay soils due to the electrical charge between water and a clay soil particle. The controller may appear to over-irrigate when it's actually maintaining sufficient water in the root zone depth for this soil-plant interaction to take place.

USDA Definitions of Soil Textures

Soils are comprised of particles with a wide variety of shapes and sizes. Depending on their size and individual mineral particles, soils are divided into three major categories:

- Sand
- Silt
- Clay

The U.S. Department of Agriculture developed a system of soil classification based on various particles sizes to define "soil texture" or the relative proportions of sand, silt and clay found in a particular soil sample. Overall, there are twelve recognized soil textural classifications based on the particle size (see Table 2). Of these twelve, five are commonly used for agronomic applications.

These are the same five categories found in the choices on *WeatherTRAK ET Series* controllers identified as:

- Sandy
- Sandy Loam
- Loam
- Clay Loam
- Clay

These classifications are determined by the percentages of soil particles that can pass through various sieve sizes. The percentage of particle sizes can impact soil-plant interactions particularly water holding/retention and infiltration/percolation properties. The following table identifies general guidelines of soil texture, water holding capability, permeability and expected controller behavior.

Soil Texture	Water Holding Capability	Infiltration / Permeability	Expected Controller Behavior
Sandy	Low	High	Frequent watering, longer runtimes
Sandy Loam	Low to Medium	Medium to High	Longer periods between watering than sandy soils but, shorter runtimes
Loam	Medium	Medium	Periodic watering, potentially the shortest run times, but some cycle and soaks expected
Clay Loam	Medium to High	Low to Medium	Periodic watering with longer runtimes than clay but fewer cycle and soak times
Clay	High	Low	Potential frequent watering, short runtimes, multiple cycle/soaks

Other physical properties such as mineral content can also determine a plant's ability to absorb and hold onto existing soil nutrients or additives from supplemental fertilization. Smaller particle sized soils such as clay, tend to absorb water slower than larger particle sizes such as sand. Soil absorption rates will also impact the number of irrigation cycles and soak times between cycles and prevent run-off or water traveling below the root zone where plant intake is ineffective.

The three major categories of soil texture represent different particle shapes. For example, a sand particle tends to be quite angular and has a fairly large particle size compared to a clay soil particle. The shape and electrical charge of a sand soil particle also results in a porous soil and tends to be fast draining that can quickly pass water and nutrients below root zones where they cannot be absorbed. Sandy soils also do not commonly compact as well as smaller more tightly shaped soil particles such as loam or clay. Clay soil typically represents the smallest particle size and also has the strongest electrical charge. Clay soil holds the soil particles tightly together slowing infiltration rates and water availability to plants.

Determining Soil Type

There are a number of field methods that can be used to quickly place your soil type in one of the three major soil texture classifications. The enclosed web link provides a step-by-step methodology of quickly determining soil texture in the field. http://soil.gsfc.nasa.gov/tbf/tbfguide.htm

For greater accuracy, detailed information and less reliance on in-field techniques, collect a large coffee can sample and contact your local Farm Advisor's office for the nearest soil lab.

The Table 1 below depicts the recognized soil size separates used to classify a particular soil, Table 2 is a soil texture classification chart depicting soil particle size percentages and soil texture classifications.

Table 1
U.S. Department of Agriculture
Size Limits of Soil Separates

Name of Separate	Diameter (Range) Sieve size in mm
Very Coarse Sand	2.0-1.0
Coarse Sand	2.0-1.0
Medium Sand	0.5-0.25
Fine Sand	0.25-0.10
Very Fine Sand	0.10-0.05
Silt	0.05-0.002
Clay	Below 0.0002

Table 2
U.S. Department of Agriculture
Soil Texture Chart
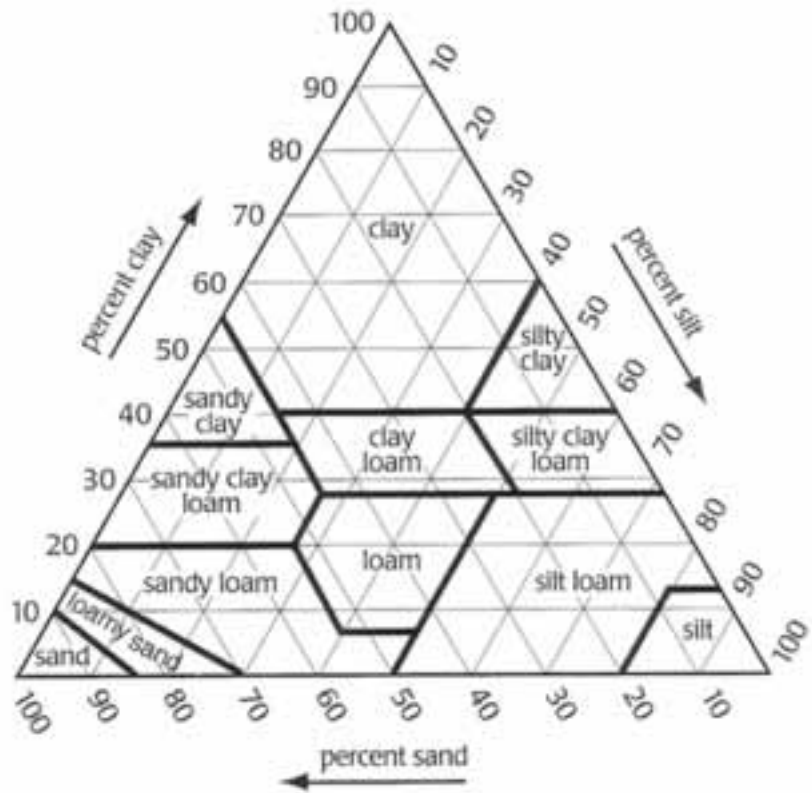
Appendix B

Introduction

This section is intended to provide a high-level overview of how different plant types and associated root depths can be selected to determine controller runtimes and frequency between irrigation.

Definitions

Crop coefficient (Kc) is defined as the ratio between the maximum water loss (evapotranspiration) of a plant or crop species at a given stage in its growth and either the potential water loss or some reference water loss. Various plant species have different Kc's depending on the time of year.

Typical Plant Type Species

The *WeatherTRAK* Series controller lists seventeen different plant types, fourteen with corresponding crop coefficients (Kc) and default root depths.

The last three plant types can be assigned custom crop coefficients (Kc) for all twelve months for Custom Plant A and B or monthly custom crop coefficients for Custom Turf. The names are simply placeholders. If a specific plant type with yearly or monthly data is known, enter the corresponding Kc and root zone depth accordingly.

Default plant type root depths can be edited from a range of 2-36" in 1" increments. Shorter root depths will result in more frequent irrigation while deeper root depths may have runtime with multiple cycles and soak times and less frequent irrigation days. If turf over-seeding is part of your annual maintenance, consider raising the root zone depth until seed germination is accomplished, then increase the root zone depth after the first mowing to adjust station runtimes.

The *WeatherTRAK* plants type choices are:
- Cool Season Turf
- Warm Season Turf
- Combined Turf
- Annuals
- Ground Cover
- Trees
- Shrubs – High Water Use
- Shrubs – Medium Water Use
- Shrubs – Low Water Use
- Mixed Shrubs – High Water Use
- Mixed Shrubs – Medium Water Use
- Mixed Shrubs – Low Water Use
- Native Shrubs / Trees
- Native Grasses
- Custom Plant A
- Custom Plant B
- Custom Turf

Plant Species Table

The following Table 1 is intended to match the *WeatherTRAK* Series controller plant type list with common plant species found throughout Sunbelt states in North America. This is not intended to be an exhaustive or comprehensive list. It is possible that some plant species have different water requirements depending on the region, sun exposure or competition with other adjacent plant species.

The "mature" root depths indicated are also intended to be representative and may vary depending on site conditions such as soil type, compaction levels and past watering practices. If an irrigation valve zone represents both trees and shrubs, set the root depth of the dominate shrub species. It's important to recognize the deeper the root depth, the longer the run time and potentially, the longer interval between irrigation days to avoid plant stress or plant loss.

Plant species for Mixed Shrubs for Low, Medium and High Water Use are not identified simply because the combinations are limitless. Select the dominate plant group when mixed shrubs are encountered and select an average root depth rather than one that is too short or too deep to avoid plant stress or even loss.

Table 1
Plant Species

WeatherTRAK Plant Type	Common Plant Names	Mature Root Depth
Cool Season Turf		
	Bent grass	3"
	Tall Fescue grass	4"
	Red Fescue	4"
	Rye grass	4"
Warm Season Turf		
	Bermuda grass	4"
	Kikuyu grass	4"
	Paspalum	4"
	St. Augustine grass	4"
Combined Turf		
	Bermuda / Rye Grass	4"
	Rye / Fescue Grass	4"
	Rye / Blue Grass	4"
	Bermuda / Rye Grass	4"
Trees		
	Birch	18-24"
	Maple Species	18-24"
	Oak Species	"
	Magnolia Species	"
	Pine Species	"
	Sycamore	"
	Ficus	"
	Willow Species	"
	Carrotwood	"
	Red Bud	"
	Ecalyptus Species	"
	Fruit Trees	12-18"
	Jacaranda Species	"

Shrubs – High Water Use		
	Calla Lily	6"
	Hydrangea	"
	Azalea Species	"
	Camellia	"
Shrubs – Med Water Use		
	Agapanthus	6"
	Bougainvillea	"
	Daylily	"
	Escallonia	"
	Ferns	"
	Geraniums	"
	Holly	"
	Hibiscus	"
	Passion Flower	"
	Gardenia	"
	Roses	"
	Star Jasmine	"
	Blue Fescue	6"
Shrubs – Low Water Use		
	Acacia	8"
	Natal Plum	"
	Junipers	"
	Myoporum	"
	Oleander	"
	Sage Species	"
	Pyracantha	"
	Bottle Brush	"
	Succulents	6"
Native Shrubs / Trees		
	Arctostaphylos	8"
	Ceanothus	"
	Coffeeberrry	"
	Rhus Species	"
	Eriogonum Species	6"
	Oaks	24"
	Sycamores	18"
	Alders	18"
	Baccharus	8"
Native Grasses		
	Buffalo Grass	6"
	Blue Oat Grass	"
	Pennisetum	"

The following Table 2 identifies default root zone depths found in the controller. Your site conditions may vary depending on whether the landscape is new vs. mature. Adjust the root zone depth for each station for the selected plant type accordingly.

Table 2
Default Root Depth for Different Plant Types

Root Depth					
Plant Type	**Sandy**	**Sandy Loam**	**Loam**	**Clay Loam**	**Clay**
Cool Season Turf	6"	6"	6"	4"	4"
Warm Season Turf	6"	6"	6"	4"	4"
Combined Turf	6"	6"	6"	4"	4"
Annuals	6"	6"	6"	6"	6"
Trees	24"	24"	24"	24"	24"
Ground Cover	6"	6"	6"	4"	4"
Shrubs – High Water Use	12"	12"	12"	12"	12"
Shrubs – Medium Water Use	12"	12"	12"	12"	12"
Shrubs – Low Water Use	12"	12"	12"	12"	12"
Mixed – High Water Use	12"	12"	12"	12"	12"
Mixed – Medium Water Use	12"	12"	12"	12"	12"
Mixed – Low Water Use	12"	12"	12"	12"	12"
Native Shrubs / Trees	18"	18"	18"	18"	18"
Native Grasses	6"	6"	6"	6"	6"
Custom Plant A	4"	4"	4"	4"	4"
Custom Plant B	4"	4"	4"	4"	4"
Custom Turf	4"	4"	4"	4"	4"

Appendix C: Soil Depletion Model

Introduction

The *ET Pro² Series* and other *WeatherTRAK*-enabled control products incorporate a soil depletion model that was developed by universities and is recognized by the Irrigation Association (IA).

The graphic below (see Figure 1) depicts some of the site variables that can impact depletion of water through evapotranspiration, soil infiltration rates and water holding properties, runoff and root depths.   Managing these and other variables determines how often to irrigate and how much irrigation to apply.

Figure 1
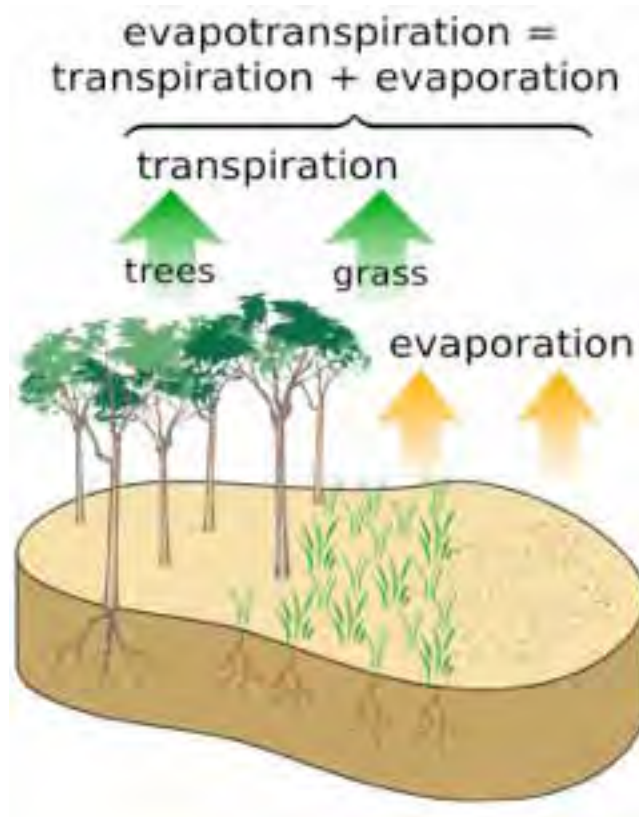
The net goal is to apply only the required amount of water to maintain plant health. The following paragraphs are intended to demonstrate how *WeatherTRAK*-enabled controllers incorporate a depletion model as a water management tool.

Definitions

To better understand some of the terminology used in this document, several definitions have been provided as follows:

- "Evapotranspiration" (ET) is unit of measure of how much water transpires from a plant and evaporates from the soil in inches per day, week or month. Variables used to properly calculate ET are solar radiation, temperature, wind, and humidity. ET is commonly listed as a daily or weekly value. For example if a weekly ET of 1.00" is identified, an average daily ET would be 1/7th of this value or 0.14".

- "Soil Moisture Depletion" or just "Depletion" is commonly identified in a percentage. In very simple terms, plants require cycles of irrigation for exchange of water and nutrients followed by a dry-out period before the next application of water. Some plant species are more tolerant to longer dry-out periods than others. For most landscape applications, the percentage of allowable depletion is commonly 50%. The Irrigation Association recognizes 50% as the percentage used in their "Best Management Practices" for determining irrigation run times and frequency.

- MAD has been defined in different ways in the irrigation industry as (1) "management allowed depletion", and (2) "maximum allowed depletion".

  "Management allowed depletion" is the percentage of total plant available water (PAW) that is to be depleted from the active root zone before irrigation is applied. This amount is "managed" by a water manager to vary the amount of water depleted from the root zone between irrigation, and thus varies the amount of stress that the plant undergoes.

  "Maximum allowed depletion" is the maximum amount of depletion that can occur without stress to the plant. The setting of both types of MAD is dependent on the type of plant and soil. In this document, the "maximum allowed depletion" definition is used.

- "Plants Available Water" (PAW) is the amount of water available to the plant in its root zone. This varies based on the soil type and plant root depth. The relationship between soil type and available water is important for maintaining optimum plant health.

- Target MAD is a feature in the *ET Pro² Series* that allows a user to increase or decrease the frequency of irrigation by changing the default depletion value of 50% in 5% increments. This function can be applied on a station by station basis providing greater flexibility in managing the soil/water balance, particularly in landscapes where native or indigenous plant material is used.

Soil / Water Relationship

The *WeatherTRAK* controller series usually uses 50% as the MAD in its depletion model. This simply means, before half of the available water in the root zone is depleted (evaporated, transpired or has traveled outside of the root zone) supplemental irrigation is added to "refill" the reservoir. Allowing the depletion amount to drop below 50% can lead to plant stress for some plant material, and once a plant has reached "permanent wilting point" (PWP), no amount of water can save the plant.

WeatherTRAK-enabled products apply this model to each station independently.

The following two examples have been developed to demonstrate how different landscape variables can dictate different run times and days between irrigation with the same daily ET. Both examples incorporate a 50% depletion value as the benchmark of when to irrigate.

Example #1
In this example, the landscape variables are as follows:

No.	Site or Landscape Attribute	
1	Sprinkler Type	Fixed Spray Head
2	Precip Rate	1.80" / hr.
3	Sprinkler Efficiency	55%
4	Soil Type	Clay Loam
5	Plant Type	Cool Season Turf
6	Root Zone Depth	4"
7	Plant Kc	0.76
8	Microclimate	Sunny All Day
9	Available Water	1.65"

Daily ET is 0.15" for 3 days in a row. The graphic below (see Figure 2) illustrates how each day after irrigation is applied, available water transpires/ evaporates and infiltrates deeper into the soil through gravity and soil properties. Each day the controller determines how much depletion has occurred to determine the next scheduled irrigation application.

Figure 2

Root Depth = 4"
Available Water = 0.37"
Target MAD of 50% = 0.18"

The "Available Water" (AW) for the soil type selected is 1.65 inches is drawn down over a three day period based on a daily ET of 0.15 inches. After the second day, the soil reservoir is 34% depleted. By the third day the soil reservoir would be 51% depleted which exceeds the 50% MAD threshold, so irrigation is applied on Day 2, to avoid deficit irrigation by the third day. The table below is intended to demonstrate how available soil water is depleted each day.

Day	Daily ET	Plant Kc	ETc (ET x KC)	Daily Depletion	Status
1	0.15"	0.76	0.114	17%	No Irrigation
2	0.15"	0.76	0.114	34%	Irrigation Scheduled
3	0.15"	0.76	0.114	51%	Depletion would have exceeded MAD of 50%

Example #2
In this example, the landscape variables are as follows:

No.	Site or Landscape Attribute	
1	Sprinkler Type	Fixed Spray Head
2	Precip Rate	1.80" / hr.
3	Sprinkler Efficiency	55%
4	Soil Type	Clay Loam
5	Plant Type	Medium Water Use Shrub
6	Root Zone Depth	8"
7	Plant Kc	0.50
8	Microclimate	Sunny All Day
9	Available Water	1.3"

Daily ET is 0.15" for 8 days in a row.

The "Allowable Water" (AW) of 1.3 inches and a Crop Coefficient (Kc) of 0.50. Again the daily ET is 0.15" and after eight days time, the water reservoir has been depleted by nearly 50% requiring irrigation because by the ninth day the 50% MAD value would have been exceeded. The enclosed table is intended to demonstrate how available soil water is depleted each day.

Day	Daily ET	Plant Kc	ETc (ET x KC)	Daily Depletion	Status
1	0.15"	0.50	0.075	6%	No Irrigation
2	0.15"	0.50	0.075	12%	No Irrigation
3	0.15"	0.50	0.075	18%	No Irrigation
4	0.15"	0.50	0.075	24%	No Irrigation
5	0.15"	0.50	0.075	30%	No Irrigation
6	0.15"	0.50	0.075	36%	No Irrigation
7	0.15"	0.50	0.075	42%	No Irrigation
8	0.15"	0.50	0.075	48%	Irrigation Scheduled
9	0.15"	0.50	0.075	54%	Depletion would have exceeded MAD of 50%

Varying Soil Types

Different soil types may have different Allowable Water and varying ET will determine when irrigation is required. Applying water before it's required can promote shallow root systems and wasted water. Frequent watering will push available water down below the root zone where it cannot be effectively absorbed by a plant. The following diagrams show the adverse affects of frequently applying too much irrigation.

Impacts of Soil and Root Depths

The following example is intended to illustrate how different soil types and root depths can impact a stations run time and the number of cycles and soak times between cycles. The table below depicts two stations with similar landscape and site attributes using the same daily ET value. The differences between example #1 & 2 are simply soil type and root depth identified in bold and underlined red text.

No.	Station Attribute	Example #1	Example #2
1	Sprinkler Type	Fixed Spray Head	Fixed Spray Head
2	Precip Rate	1.80"/hr.	1.80"/hr.
3	Sprinkler Efficiency	55%	55%
4	Soil Type	Clay Loam	Sandy
5	Plant Type	Cool Season Turf	Cool Season Turf
6	Root Zone Depth	4"	5"
7	Plant Kc	0.75	0.75
8	Microclimate	Sunny All Day	Sunny All Day
9	Daily ET	0.19"	0.19"

The net result is the *WeatherTRAK* controller applies irrigation and soil science to automatically determine the proper run time based on these site and environmental differences.

Example #1
Watering Schedule

ST01 A 07.8 MIN 02X AUTO
WK1 SMTWTFS +00% SOAK 5
WK2 SMTWTFS

Example #2
Watering Schedule

ST01 A 08.6 MIN 01X AUTO
WK1 SMTWTFS +00% SOAK 5
WK2 SMTWTFS

As weather changes (ET increasing or decreasing), the amount of water and the frequency of water being applied will vary as depletion increases or decreases.

To properly address daily weather changes using a conventional controller would require multiple calculations for each station, then physically adjusting the irrigation schedule every day. By contrast *WeatherTRAK* incorporates weather changes and automatically adjusts station run times and frequency to achieve optimal plant health while maximizing water savings.

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