



# OptiRain Windows

## Users Guide

OptiRain™ is a Trademark of QuickSmart Development  
EtherRain™ is a Trademark of QuickSmart Development

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# Introduction

OptiRain provides irrigation scheduling for one or more EtherRain controllers. OptiRain provides five independent irrigation programs to each EtherRain controller. Each program has calendar, weather, multi-cycle, and ordinance restriction control, among other features.

## Ease of Use, Conservation, and Economy

OptiRain was developed with ease-of-use as the primary goal. The secondary goal is to provide features that allow optimal irrigation setting to avoid unnecessary water usage and to save money.

In order to accomplish both goals, that is, to offer a user interface that is intuitive and powerful, the number of set-up parameters has been limited to those that are easily described, easily specified and have a high impact on irrigation. While OptiRain does provide a wide range of irrigation control no doubt OptiRain will not meet every irrigation need.

## Controls for Optimal Irrigation

OptiRain offers the following features to provide you with optimal irrigation for your application:

1. Calendar scheduling
2. Monthly scaling/irrigation setbacks
3. Weather dependent irrigation programs
4. Temporary inactivation with auto re-start
5. Program parking (program deactivation)
6. Ordinance restrictions - even/odd
7. Multi-cycle

## Version Update Information

Previous versions of OptiRain Windows supported the Weather Underground weather feed. Weather Underground has since discontinued this feed and so all support for the feed has been removed in this version of OptiRain Windows. Weather Underground has a replacement feed for those who contribute to their network. OptiRain may support this new feed if there is interest.

The Yahoo! Weather feed has been improved. It now provides forecast information for two days including a forecast condition code for two days. The additional codes can be used to halt irrigation if rain is forecast within the next two days.

This Users Guide replaces the integrated Help system for OptiRain.

# Getting Started

To use OptiRain in the most effective manner you'll need to understand some basic terms and concepts. This section provides an overview of these concepts in order to allow you to get started. Subsequent topics provide more in-depth information to allow you to fine-tune your schedule.

## Computer

OptiRain provides scheduling services for EtherRain controllers. The OptiRain host computer must have a Microsoft Windows 10 operating system or higher. Support for other versions is no longer provided. The computer must be awake when irrigation events are scheduled to run.

## Basic Networking

The OptiRain host computer must be connected to the same network as the EtherRain controller or controllers that it will be scheduling. OptiRain scheduling software will not be able to detect EtherRain controllers that are on a different network.

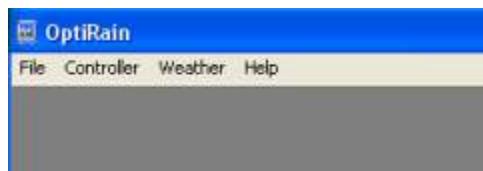
The EtherRain controller must be configured so that its IP address and Network Mask match that of the network to which it is attached. If the network has a DHCP Server, most do, then EtherRain will receive the network addresses that it needs from the DHCP server and will work fine.

## Full Installation of OptiRain

OptiRain consists of two programs and for actual scheduling to occur both programs must be installed. OptiRain User can be installed separately to test interface features.

## The Main Menu

This documentation refers to the "Main Menu Bar" The Main menu bar is shown here for your reference:



# What is a Device?

OptiRain is used to build and maintain irrigation schedules for EtherRain controllers. Within OptiRain these controllers are known and referred to as "devices." The word "device" is used because OptiRain supports both actual physical devices (ie, real controllers) and virtual devices.

## A Virtual Device?

A *virtual device* doesn't actually exist, it is only a record in a database. OptiRain supports virtual devices for the following reasons:

- to allow users to experiment with schedules
- to allow users to test out scheduling features
- to allow users to try out the schedule making interface without having to first obtain an EtherRain device.

Once defined, a virtual device can be converted to an actual device by simply changing the name of a real device to match that of the virtual device.

## On Start Up

When OptiRain starts up it looks for real devices that are attached to the network. If it finds any it lists those devices within the Device Manager Window. Real devices are tagged with the word "active" in the Device Selector List. Any virtual devices that were created by the user are also listed.

Here's what the Device Manager window looks like:



# The OptiRain Irrigation Schedule

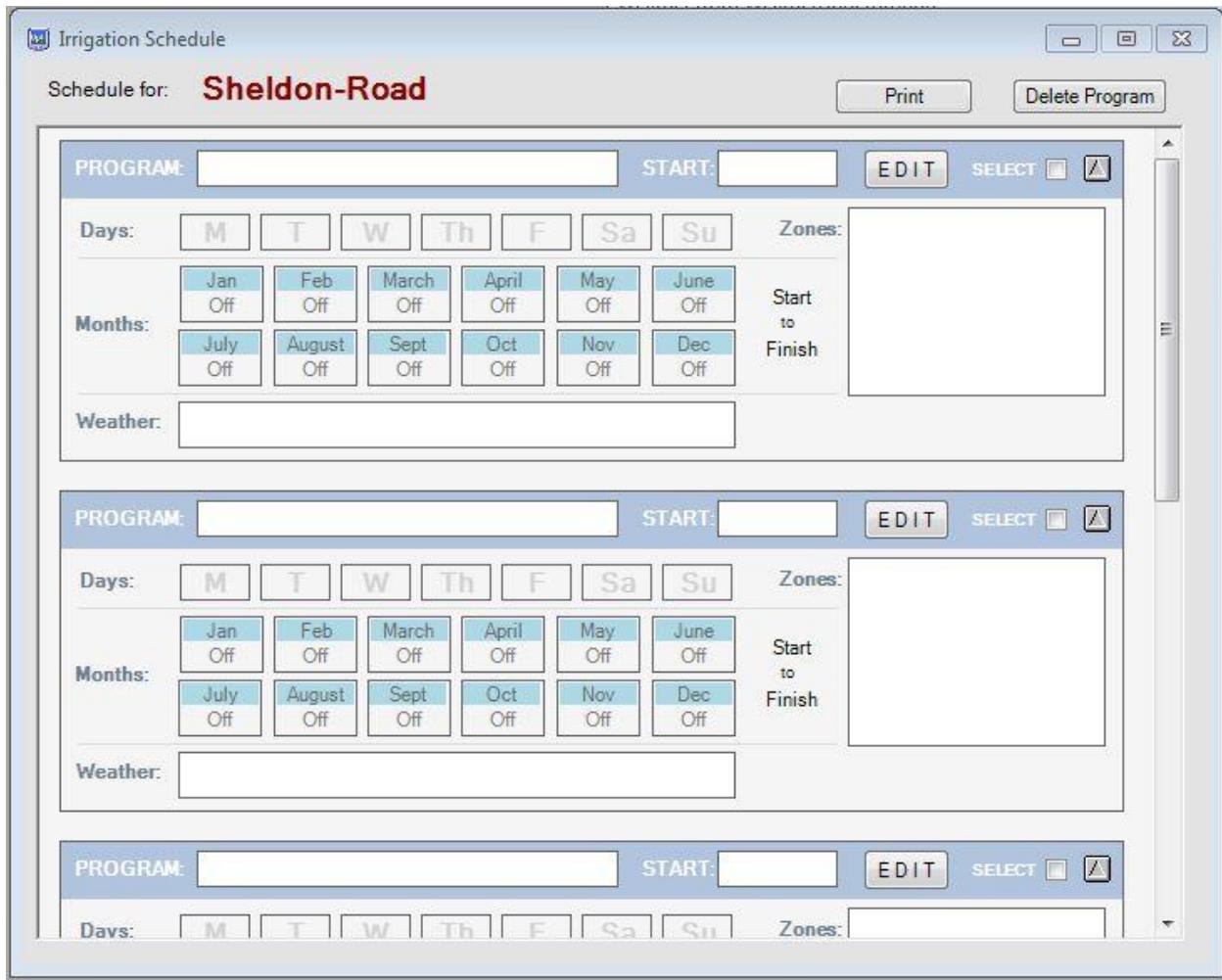
A schedule, also called an irrigation schedule, is a group of programs defined for a particular controller. In OptiRain a schedule consists of from one to five programs. Here's an example schedule containing two active programs:

The screenshot shows the OptiRain Irrigation Schedule software interface. At the top, it says "Schedule for: Sheldon-Road". There are "Print" and "Delete Program" buttons. Below that, there are three program sections:

- PROGRAM: Main**  
START: 5:30 AM  
Days: M T W Th F Sa Su  
Months: Jan Off, Feb Off, March Off, April Off, May 50%, June 100%, July 100%, August 100%, Sept 75%  
Weather: Deactivate below 68F; Deactivate on: Rain; Forecast PoP > 60%  
Zones: front- 20 m, back- 20 m, side- 20 m  
Time: 5:30 AM to 6:30 AM
- PROGRAM: Fence Cycle**  
START: 6:45 AM  
Days: M T W Th F Sa Su  
Months: Jan Off, Feb Off, March Off, April Off, May 50%, June 100%, July 100%, August 100%, Sept 100%  
Weather: Deactivate on: Rain; Rain Gauge > .02in; Forecast PoP > 60%  
Zones: Fence- 20 m  
Time: 6:45 AM to 7:15 AM  
Buttons: 2 CYCLES
- PROGRAM:**   
START:   
Days: M T W Th F Sa Su  
Months: Jan, Feb, March, April, May, June  
Zones:

A schedule is defined within OptiRain by first selecting a device and then clicking the "Show Schedule" button from the Device Manager window. If no programs are found for the device, an empty schedule is displayed. To create a new program, click the EDIT button on an empty program form to create the first program for this schedule. Here's what an empty schedule looks like:

## An Empty Schedule:



# An Irrigation Program

An irrigation program is an element of an irrigation schedule. An irrigation schedule consists of a set of independent programs.

The screenshot shows a software interface for managing irrigation programs. At the top, it displays "PROGRAM: Demonstration", "START: 8:15 AM", and "EDIT" and "SELECT" buttons. Below this, there are sections for "Days" (M, T, W, Th, F, Sa, Su), "Months" (Jan Off, Feb Off, March Off, April Off, May 50%, June 100%, July 100%, August 100%, Sept 100%, Oct Off, Nov Off, Dec Off), and "Weather" (Deactivate below 68F; Deactivate on: Rain; Rain Gauge > .02in; Forecast PoP > 60%). The "Zones" section indicates "front- 10 m", "back- 10 m", and "side- 10 m" with a timing range from 8:15 AM to 8:55 AM. There are also buttons for "ODD ONLY" and "2 CYCLES".

A program contains all the information needed by the controller to activate the water valves at the desired time and for the desired length of time. In OptiRain, this includes the following information:

1. Program Name
2. Start Time
3. "On-times" in minutes for each Zone
4. Days of the Week that the cycle is to be activated
5. A scale factor for each month of the year
6. Weather dependency information.
7. Number of cycles for the program (default is one).
8. Irrigation ordinance enforcement instructions.

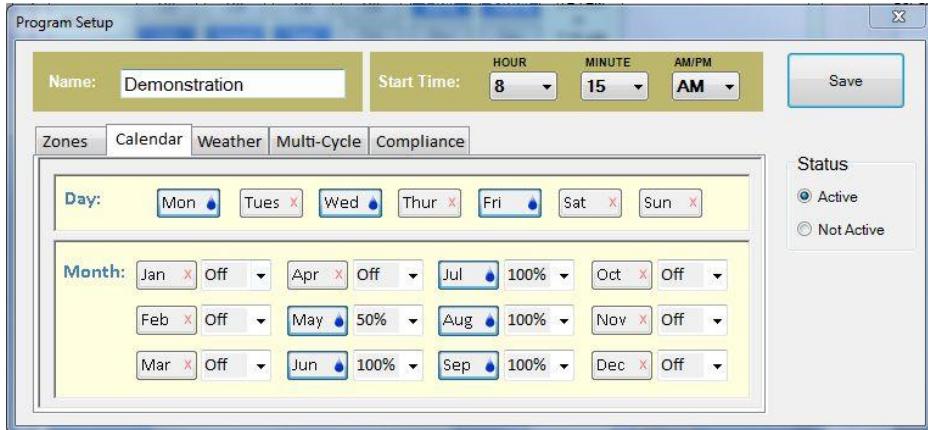
A program is defined or changed by clicking the EDIT button on the program summary which is shown above. When the Edit button is clicked, the following dialog box is displayed allowing entry of data. Notice five tabs within this window labeled: Zones; Calendar; Weather; Multi-Cycle; and Compliance:

## Zones Tab

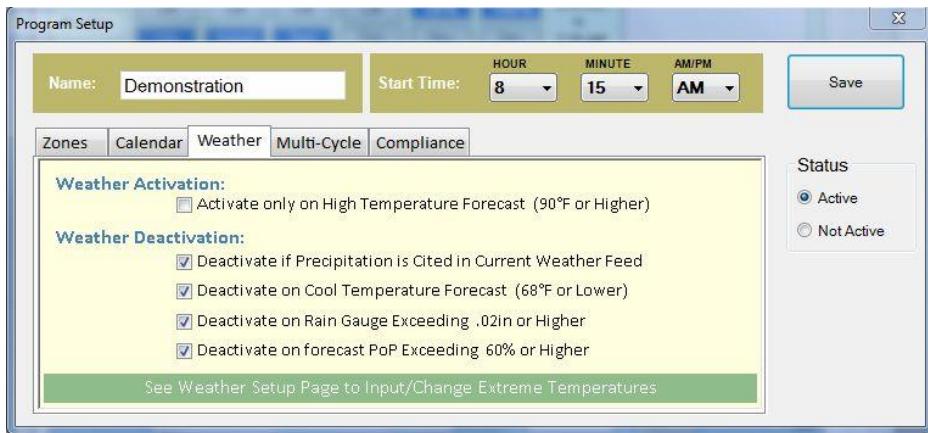
The screenshot shows the "Program Setup" dialog box with the "Zones" tab selected. It includes fields for "Name: Demonstration", "Start Time: 8:15 AM", and a "Save" button. The main area displays a table of zones with their names and run times. The table has two columns of two rows each. The first row contains V1 (front) and V5 (Zone 5). The second row contains V2 (back) and V6 (Zone 6). The third row contains V3 (side) and V7 (Zone 7). The fourth row contains V4 (Fence) and V8 (Zone 8). To the right of the table is a "Status" section with radio buttons for "Active" and "Not Active". A note at the bottom states: "Zone names can be changed from the device manager window."

Zone Name	Minutes	Zone Name	Minutes
V1 front	10	V5 Zone 5	0
V2 back	10	V6 Zone 6	0
V3 side	10	V7 Zone 7	0
V4 Fence	0	V8 Zone 8	0

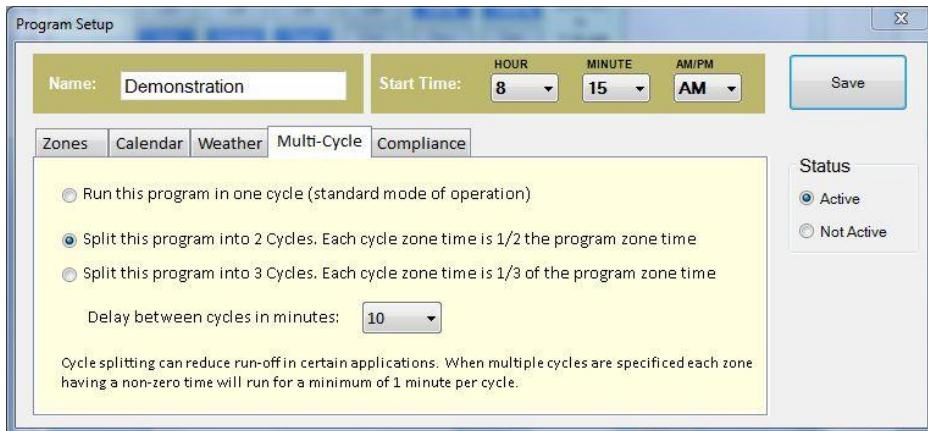
## Calendar Tab



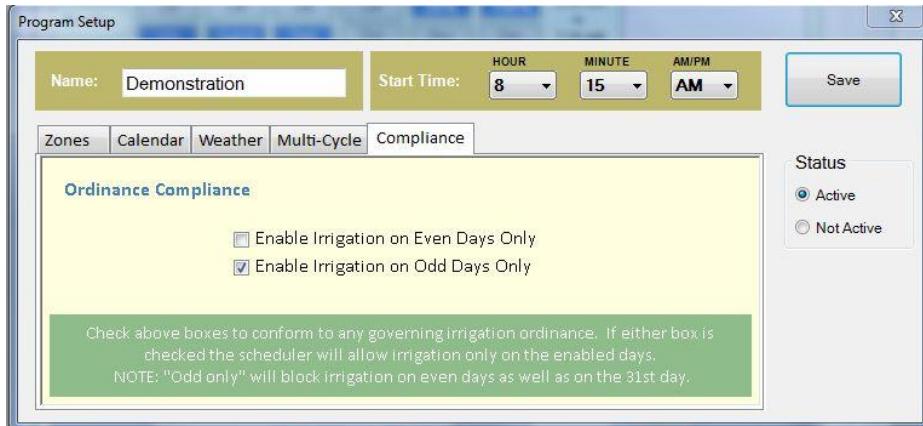
## Weather Tab



## Multi-Cycle Tab



## Compliance Tab



### Program Name

Every program must have a unique name. To more easily manage your programs, it's best to name the programs in a way that is descriptive of some aspect of the program.

### Setting the Start Time

The start time is the fundamental parameter for every program. The start time can be set from the drop-down boxes for Hour, Minute, and AM/PM.

### Program Activation

The program that you are defining is active by default. You can deactivate it by clicking the "not active" radio button on the right side of this window. This is useful for storing program definitions that you might want in the future or to temporarily turn off individual programs.

There is more detailed information on how to set up a program in the section below titled "[Setup Procedures: Creating a Program](#)."

# Weather Dependent Irrigation

There are two steps involved in establishing a weather dependent program.

1. Selecting a weather provider
2. Setting up the dependency conditions

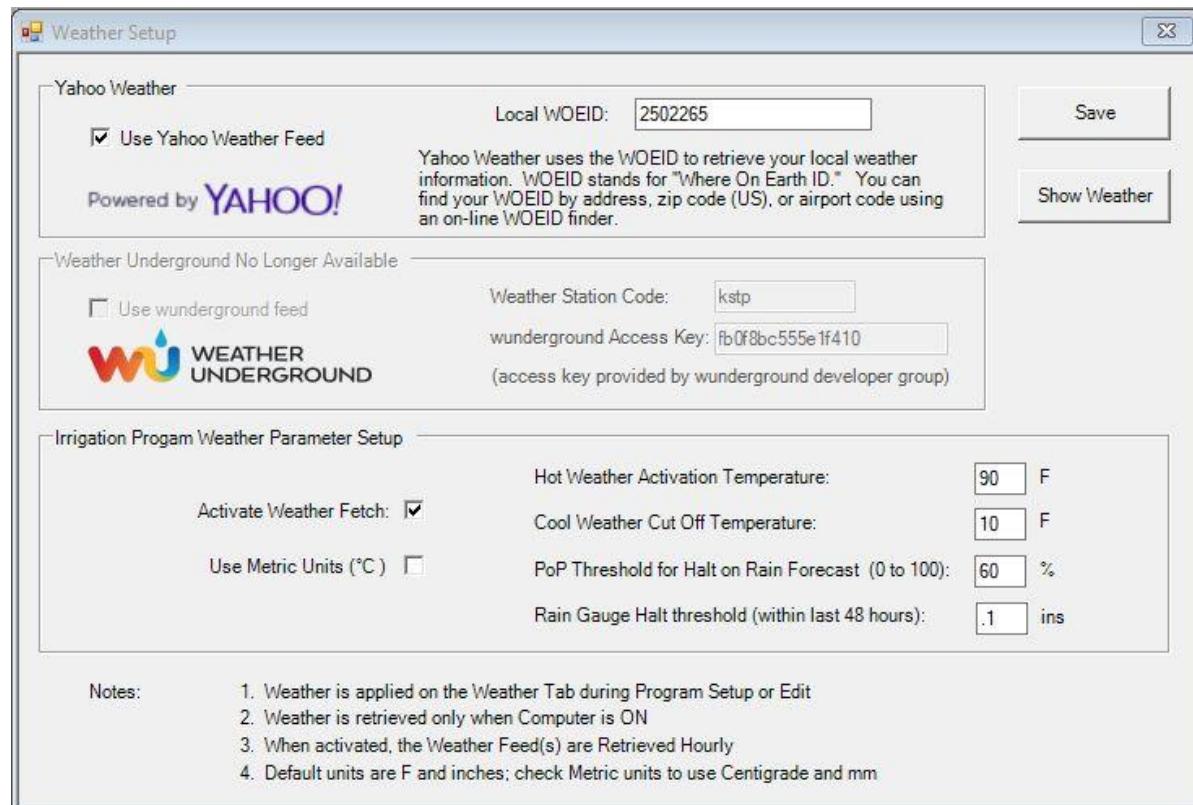
For a weather dependent cycle there is a need for a regularly updated weather feed. This feed can come from the built-in Yahoo Weather feed.

This is a quick introduction to using weather in OptiRain. For more in-depth information please view the section of this document titled "Weather."

## The Weather Setup Window

The Weather Setup window is accessible from the Main Menu bar under the Weather item. The controls provided on the Weather Setup window allow you to select a weather feed, enter required location codes and access keys, and then enter weather related thresholds. Weather Setup window:

NOTE: The Weather Underground PWS Feed is now supported as of May 2019.



## Selecting a Weather Feed

To use Yahoo Weather, you need to select and enter a Yahoo Where on Earth ID - WOEID. Yahoo Weather forecasts, and WOEID IDs are also available for locations around the world

For more information on Yahoo WOEID and to obtain a WOEID for your location search the web using the following term: Yahoo WOEID

To use the Weather Underground Personal Weather Station feed (PWS), you must obtain a key from Weather Underground. They offer access keys to those who contribute data to their network. Along with the key, you must select a weather station from their Weather Underground map.

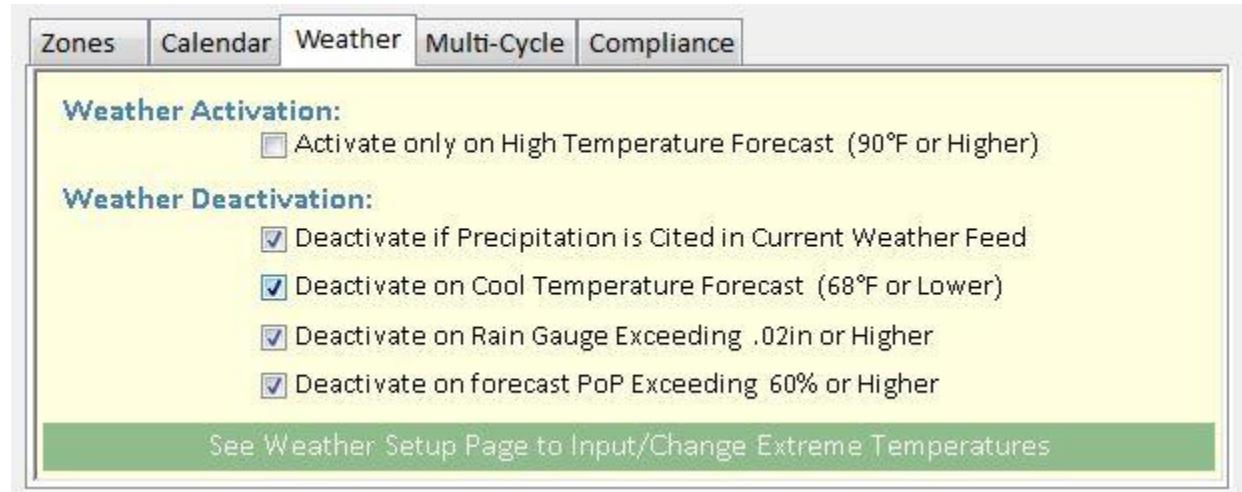
## Weather Thresholds

OptiRain defines weather related thresholds to define levels that define whether an irrigation cycle should either run or be blocked. The thresholds are set by the user. The numbers that you set should match the scale the you are using: Fahrenheit/inches or Centigrade/millimeters.

The Weather Setup window provides fields to accept the defined thresholds. For more information about how OptiRain makes decisions about running or blocking an irrigation cycle based on these settings please view the section of this document titled "Weather."

## Applying Weather Dependency to a Program

Select a device and open its schedule. Click the "edit" button of the program that you wish to make weather dependent. Click the weather tab.



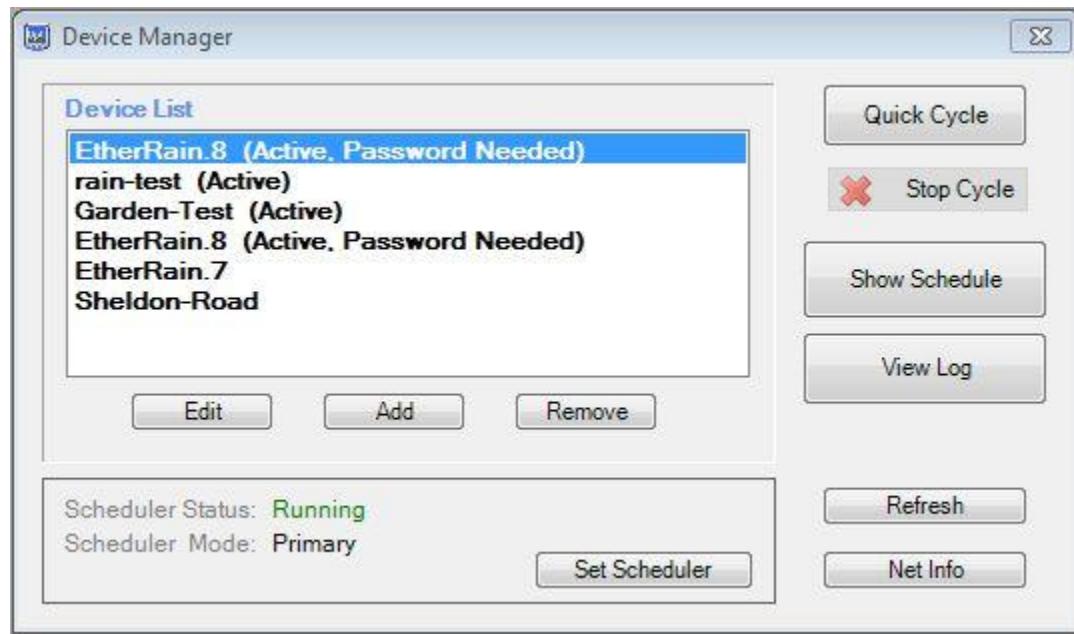
The threshold settings that you enter on the Weather Setup Page are displayed in the check box labels. Click the checkboxes to add desired weather controls to your program.

## Using Local Weather Data from a Personal Weather Station

Weather Underground offers access keys to contributors of their network. If you have a personal weather station, the easiest way to use your data is to contribute to the Weather Underground network. When you contribute to their network you can receive from them an access key that allows you to receive a PWS contributors feed. With the Weather Underground PWS access key, you can use your own weather station data to control your irrigation. It may seem odd to use Weather Underground feed for your own data, but they have developed a standard API that makes it easy to retrieve data, plus they offer a forecast overlay.

## The Device Manager Window

The Device Manager Window is the most used window in OptiRain. The Device Manager window looks like this:



This window is presented upon startup. In addition, it can be displayed by clicking the Controller Menu on the main form and then clicking "Select Device" menu item.

From the Device Manager the following functions are accessible:

Device Edit  
Device Add  
Device Remove  
Scheduler Service Status  
Scheduler Operating Mode Status  
View Schedule  
Quick Cycle (run a manual cycle)  
Stop Cycle  
View Log (view the commands log)  
Refresh Device List  
View Device Network Address

## The Scheduler

OptiRain consists of two software programs:

1. OptiRain User – the user interface program
2. OptiRain Scheduler

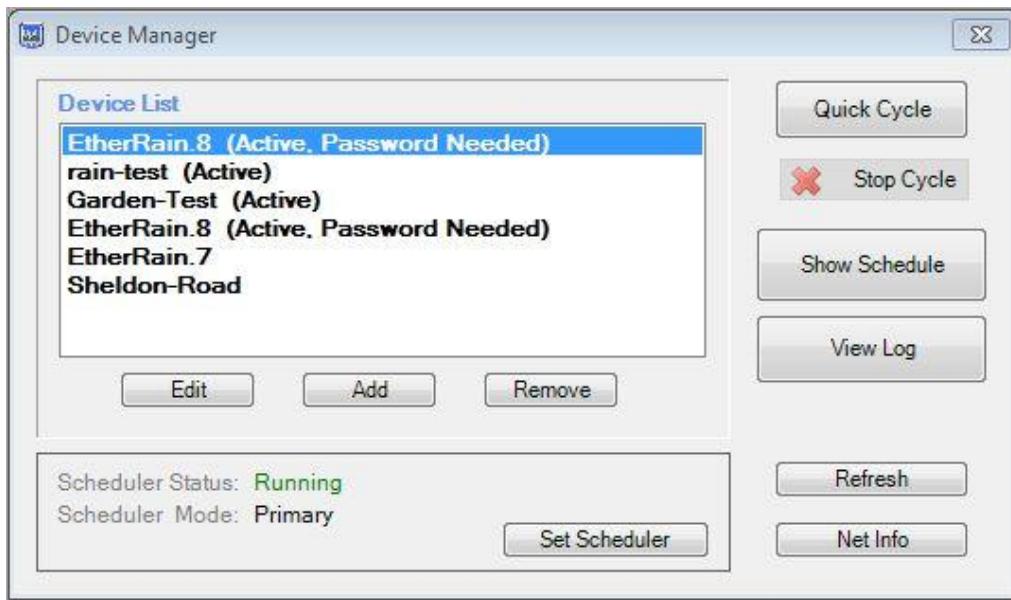
OptiRain Scheduler is a special program called a Windows Service. Once it is installed it runs in the background whenever the computer is on. It has no user interface and has no shortcut icon. The Scheduler can be uninstalled just like a standard program. In addition, the Scheduler can be started and stopped from the Device Manager Window of OptiRain. Once installed, the Scheduler will start automatically whenever the computer is powered up or reset.

### What Does the Scheduler Do?

The Scheduler reads the irrigation schedule files that you set up using OptiRain User, and it sends irrigation commands to the controller so that the controller starts at the desired time and opens and closes the desired zone valves for the desired amount of time. The scheduler sends one command for a complete cycle to the device. The Scheduler sends a follow up status command to the device after the cycle is scheduled to complete, to log the results.

## How Do I know if The Scheduler Is Working?

You can tell if the Scheduler is running by looking at the Device Manager Window. The Scheduler status is shown in this window. If the Scheduler is working you will see the word "Running" in green. If the scheduler is not running you will see "stopped" or "not installed." Device Manager Window showing Scheduler Running:



In addition, when the scheduler is started or stopped a note is made in the log.

## How Do I know if The Irrigation Cycles are Running?

Check the log. The log is accessible from the Device Manager Window. Whenever a command is sent to a Controller, it is recorded in the Log. The log line will also list important information including status of the command. The command log records are dated and if you don't see command log entries for expected commands, then the scheduler may not be working. For information on how to read the command log, see the section in this document titled "Common Task Guide."

## How Do I know if Controller is Working?

If the controller isn't working, the log will indicate that there was no response from the controller when it attempts to send the command to it.

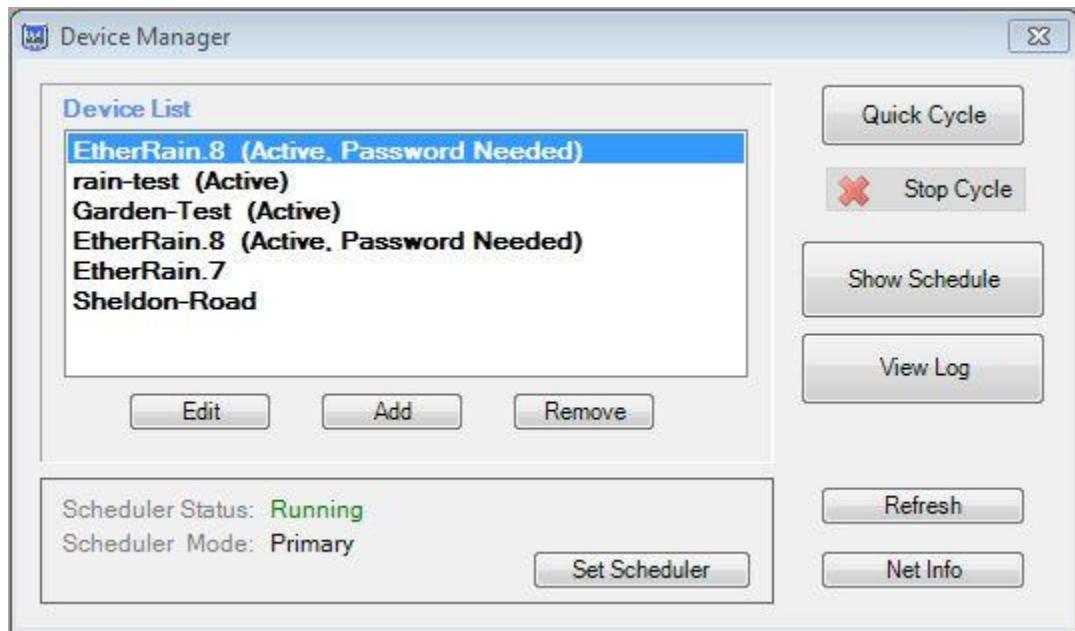
Remember to check the actual irrigation flow to your landscape (make sure the water is turned on!)

# Common Setup Procedures

This chapter provides instruction on how to accomplish common setup tasks within OptiRain.

## Creating A Device

When OptiRain first starts up, it searches the network for controllers using a built-in controller discovery routine. All controllers that it finds are listed on the Device Selector List in the Device Manager Window.



OptiRain also lets you create devices that don't actually exist so you can test the scheduling features and build experimental schedules. Any virtual devices that you create are also shown on the Device Selector List. Devices that are found on the network are listed with the word "Active" following their name. Devices in the list that don't have the word active following the name are either virtual devices or the physical controller was not found on the network.

## Building an Actual Device

OptiRain creates a data record for all new devices that it finds on the network. The devices are identified by device name. To customize and configure an actual device select the device and click the Edit button located under the selection list box. The device builder form will be displayed as shown below.

### Device Builder: Editing an Existing Actual Device

The screenshot shows a Windows-style dialog box titled "Edit Active Device". At the top left are fields for "Device Name" (Garden-Test), "Password" (two asterisks), and "Location" (garage). On the right are "Save" and "Cancel" buttons. Below these are eight rows for configuring zones, each consisting of a "Zone Name" field (e.g., Front, Side, Back, Tree, Zone 5, Zone 6, Zone 7, Zone 8) and a "GPM" field (e.g., 3, 6, 9, 0, empty, empty, empty, empty). To the right of the zone configuration is a small green owl icon and a "Configure Device" button. At the bottom left is a checked checkbox for "Join Rain Sensor Share Group".

From the device builder form you can provide custom zone names and provide location information for the controller. You can also configure the operating parameters of the controller.

## Password Entry

The first time that a controller is discovered on the network, OptiRain searches its database to find the device. If it doesn't have a record of the device, it creates one. OptiRain doesn't initially know the password of the device, so you must supply the password before the controller can be used.

The default password for new EtherRain Controllers is: pw

You must enter the default password and then click save to allow OptiRain to communicate with the controller. Once the password is entered OptiRain will remember it. The password can then be changed at any time afterward.

## Rain Share

Check the rain share box if you have multiple controllers and only have a rain sensor attached to one controller. By joining the rain sensor share group this controller won't need to be connected to a local rain sensor in order to block rain. NOTE: the rain sensor input from any rain sensor reporting rain is checked before an irrigation cycle. If rain is detected the cycle will be blocked. If rain is detected after the cycle has started the rain share group devices will not stop. Only the controller connected to the rain sensor will stop.

## Building a Virtual Device

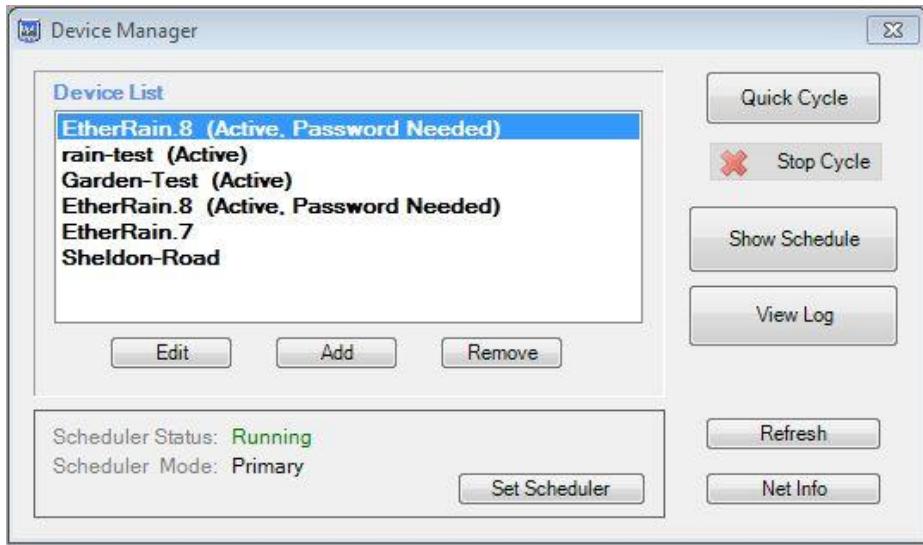
To build a new virtual device, click the Add button located under the Device Selection List within the Device Manager Window. The device builder form will be displayed. Enter in Zone names and virtual location then click save. A password cannot be entered for a virtual device.

### Device Builder: Adding a new Virtual Device

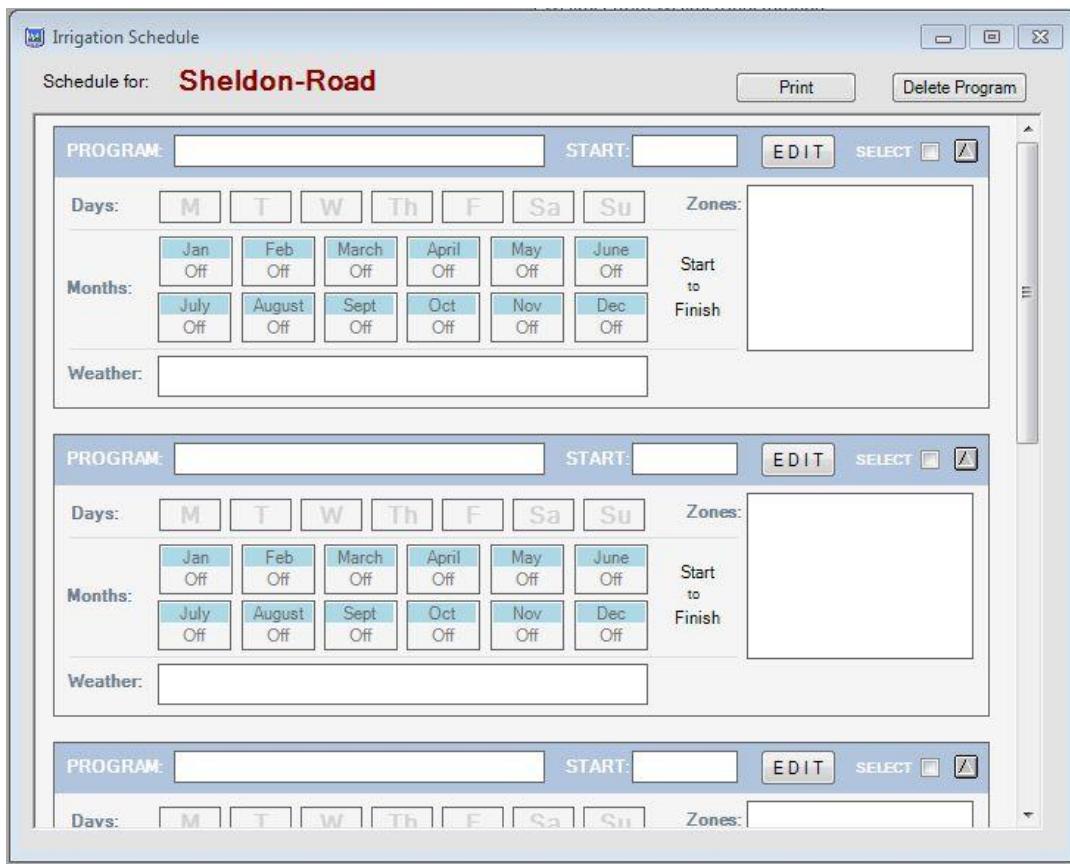


# Create a Schedule

To Create or Edit a Schedule for a device, first select the device from the Device Selection List within the Device Manager window.

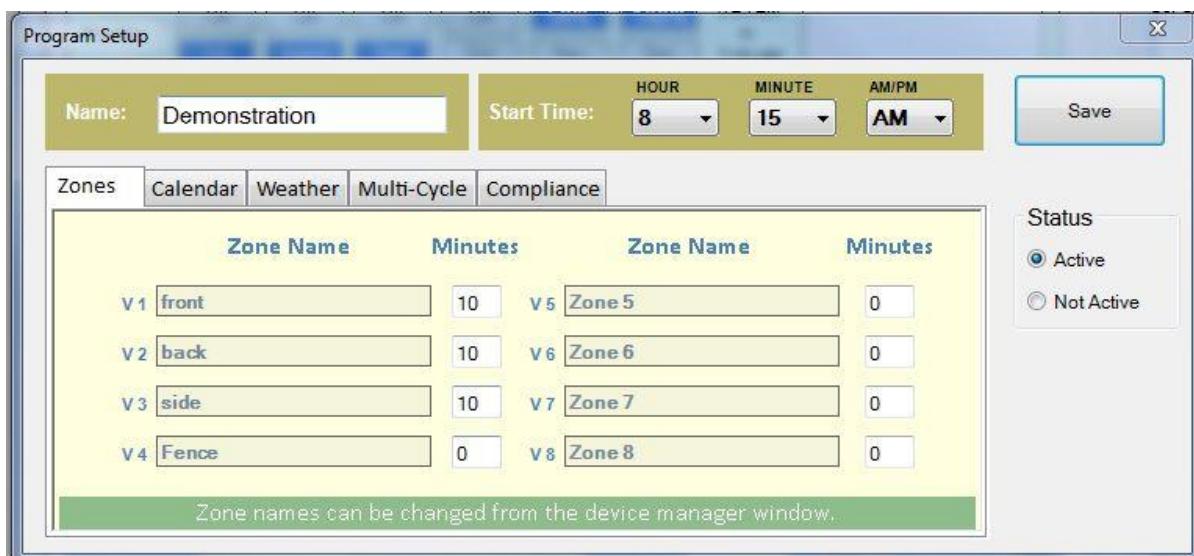


Click the "Show Schedule" button. The Schedule window will be displayed:



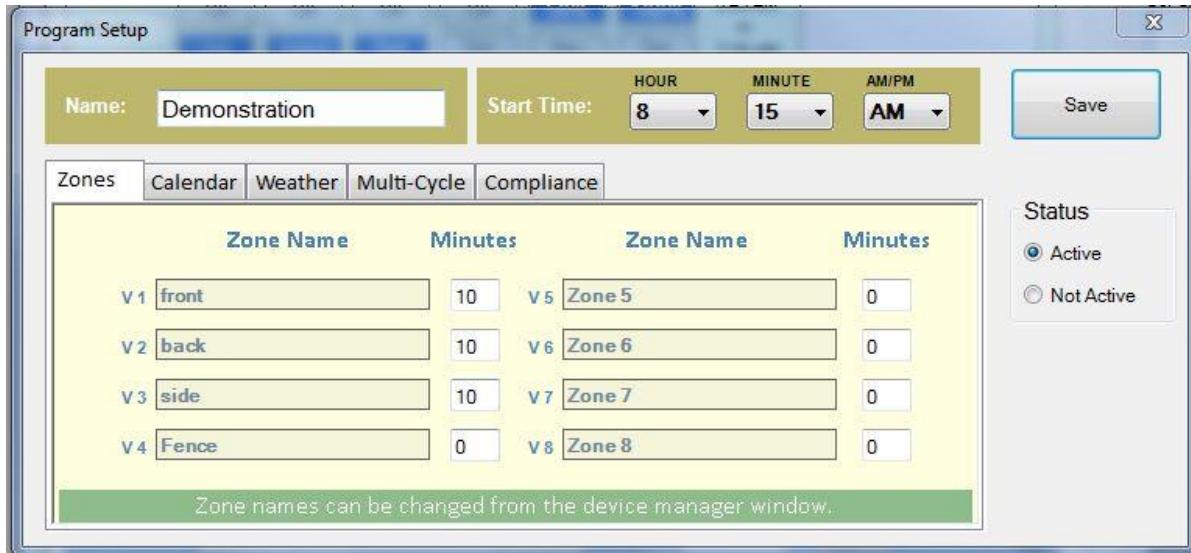
If the device or controller is new, the schedule window will contain a list of five empty program summaries. You can now build a schedule by creating one or more programs. You can create a program by clicking the Edit button on the topmost empty program summary block.

After clicking the Edit button on one of the program summary objects the following window will be displayed:



# Creating and Editing a Program

To create or change the parameters of a program, select a device from the Device Selector List in the Device Manager Window. Click "Show Schedule." Click the "Edit" button on one of the five program summary blocks displayed in the Schedule Window. The following window is displayed:



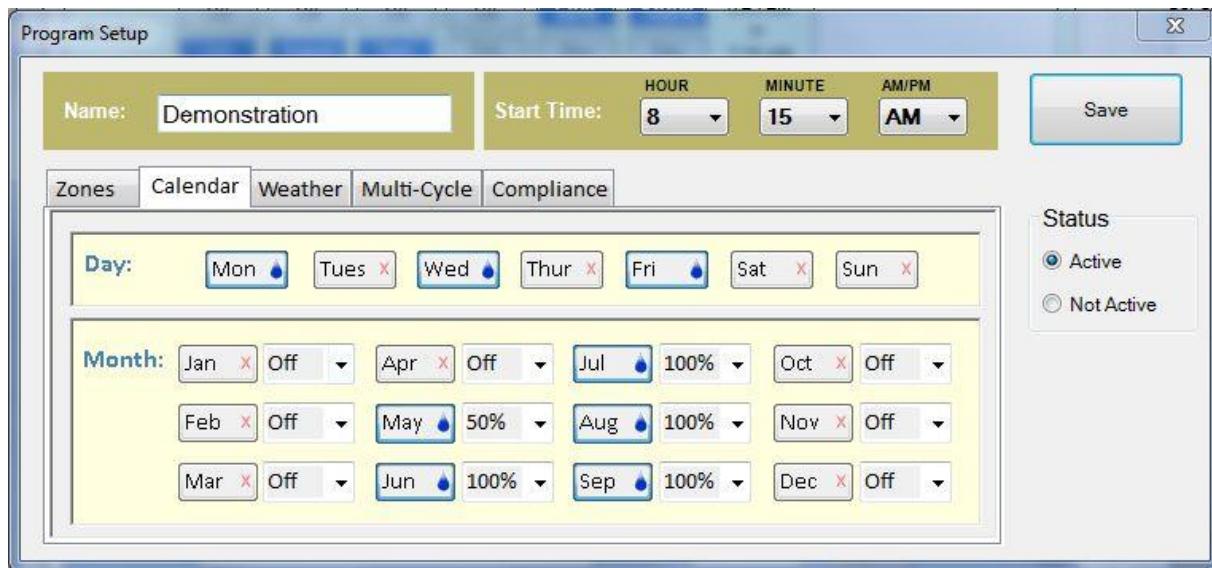
From this window you can enter all the information needed to create a program. The following information can be entered:

Program Name

Start Time

Run-time for each Zone in Minutes

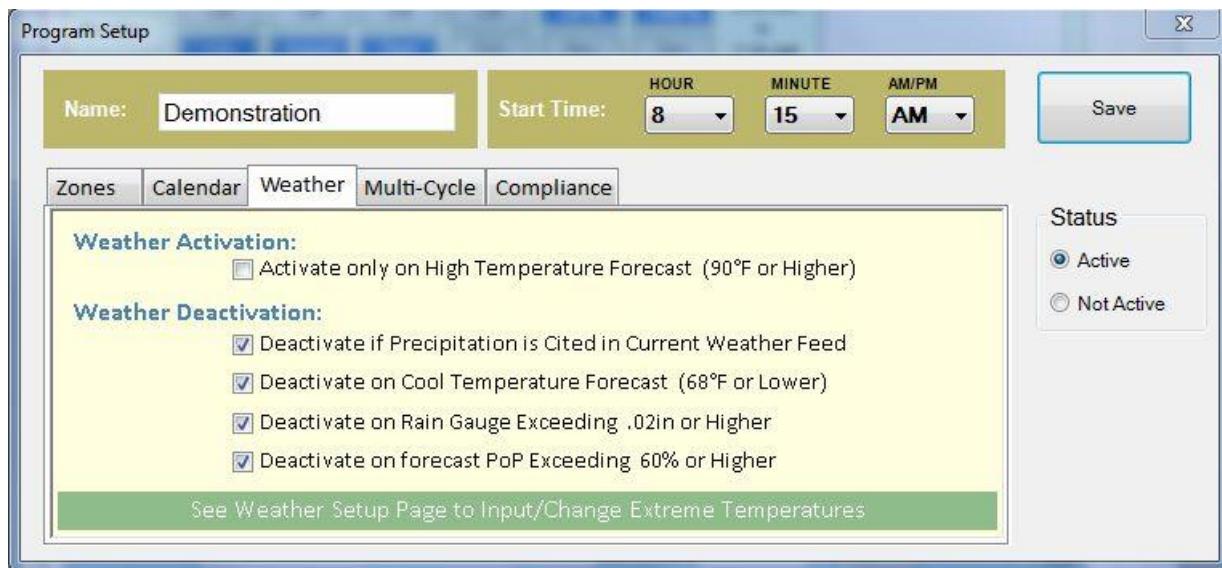
Next, click the Calendar Tab in the Program Setup Window.



The following information can be entered:

Days of the Week that program is Active  
Months of the Year that program is Active  
On-Time Scaling factor for Each Month

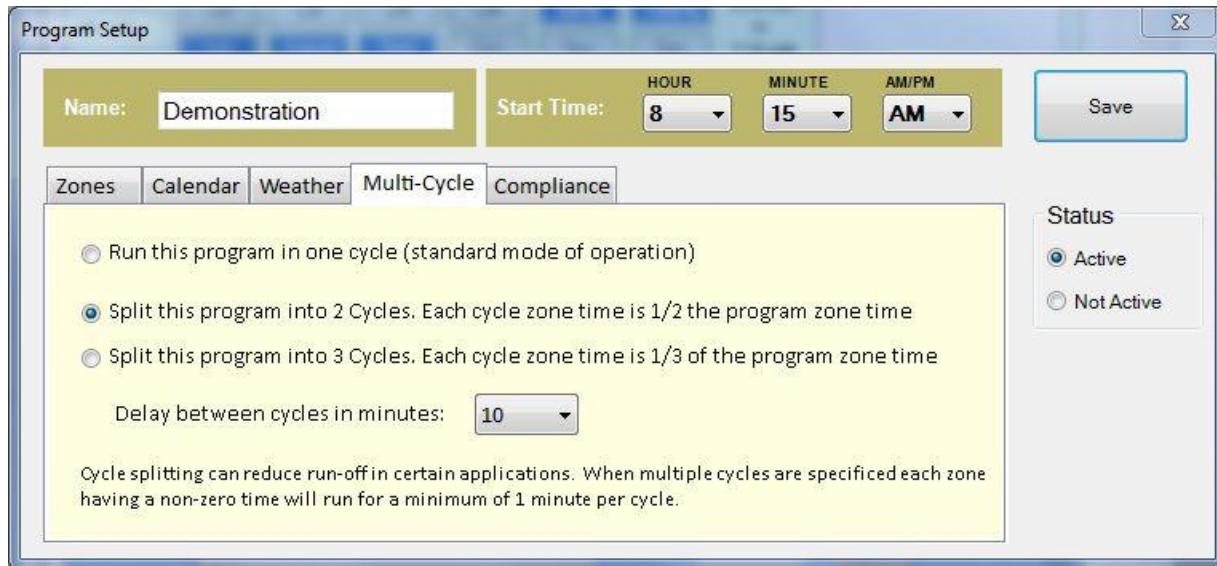
Next, click the Weather Tab in the Program Setup Window. The following fields will be displayed:



The following information can be entered:

- Activate On high temperate (forecast or actual)
- Deactivate on rain or precipitation in current weather feed
- Deactivate on Cool Temperature forecast
- Deactivate on rain gauge exceeding threshold
- Deactivate on PoP forecast exceeding threshold

Next, click the MultiCycle Tab. You can set your program to run in 1, 2, or 3 cycles. The default value is 1, this is used for most programs. If you select 2 or 3, your program will be divided into 2 or 3 cycles and the run times will be automatically set to 1/2 or 1/3 of the listed zone minutes. This is mainly for use in landscapes where reducing run off is required.



Next, click the Compliance Tab in the Program Setup Window. If your installation is subject ordinances of the Odd day or Even day variety, you can restrict irrigation to either Even days only or Odd days only. If you select Odd days only, then irrigation will also be blocked on the 31st day of months containing 31 days.



## Create a Weather Dependent Program

Creating a weather dependent program requires two steps:

1. Setup the Weather
2. Setup the dependency conditions

OptiRain provides the ability to receive weather feeds from Yahoo! Weather.

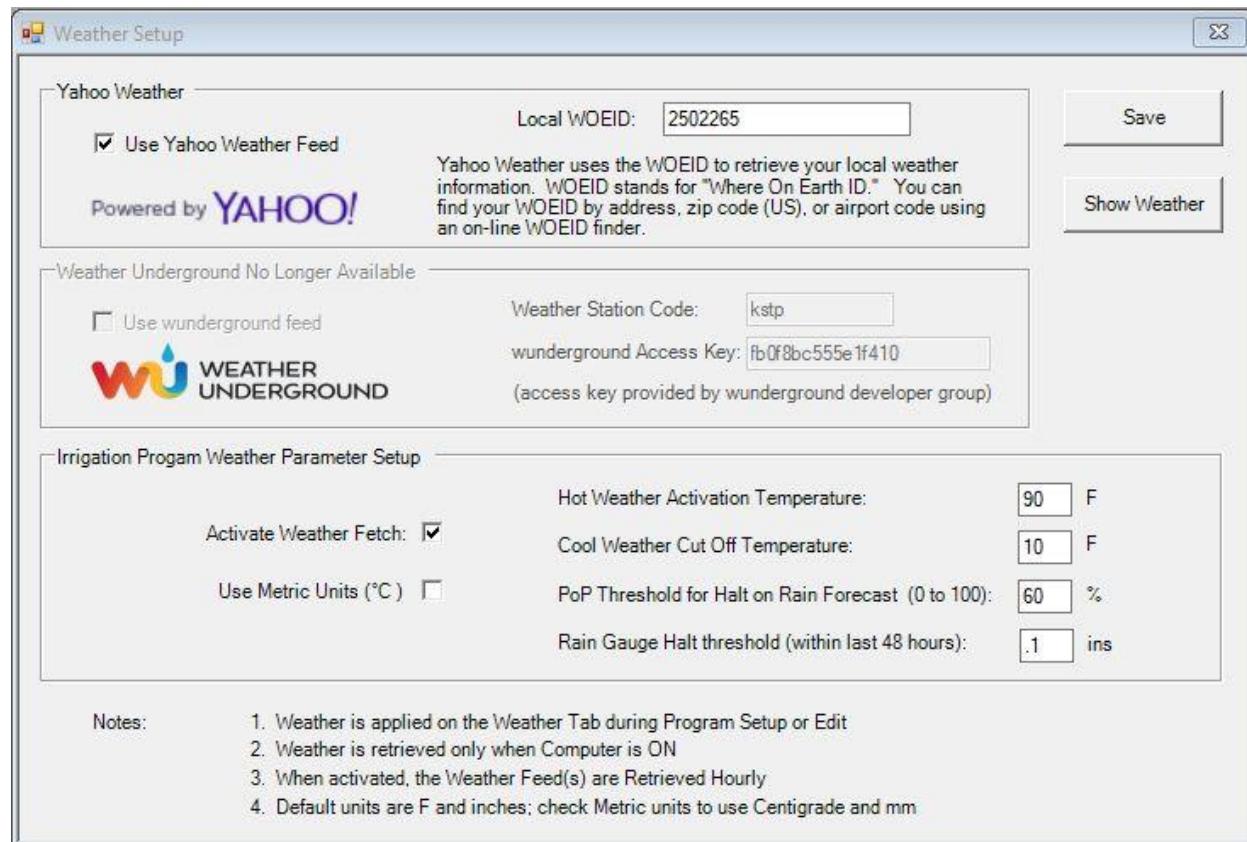
Weather parameters are entered on the weather setup form

This is a summary of the weather control features of OptiRain Windows. For a complete feature overview and usage guide for weather control, please see the section of this guide titled "Weather."

## Weather Feed

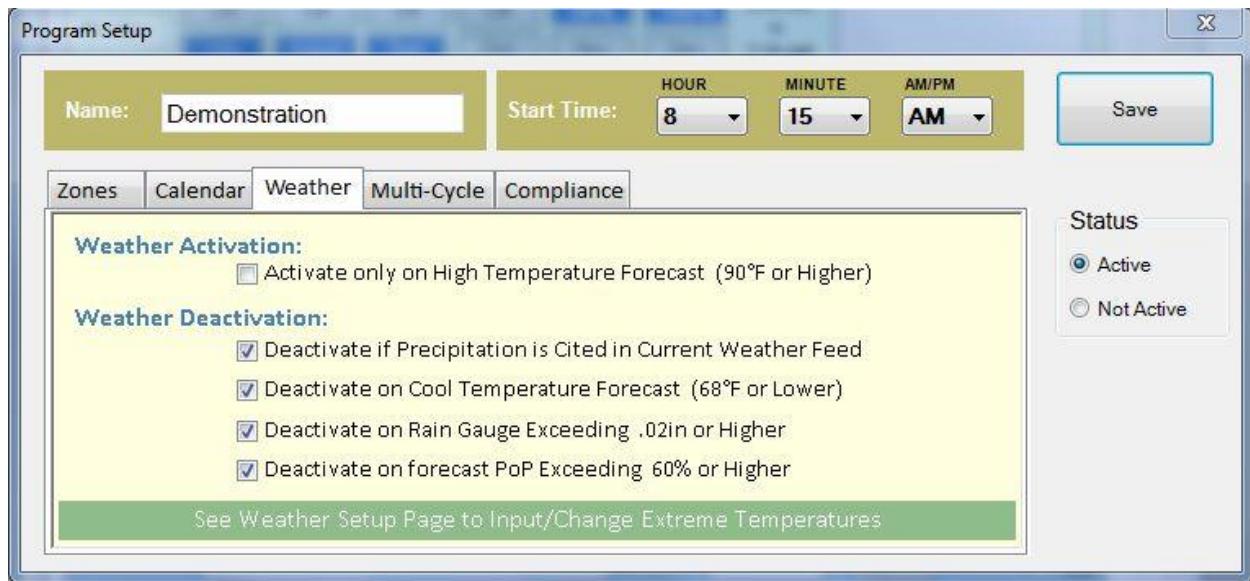
To employ a weather dependent program, you'll need to select a weather feed. If using Yahoo! Weather enter your WOEID location code, and click the "Activate Weather Fetch" checkbox in the Weather Setup Window, as shown here:

Note: As of May, 2019, OptiRain supports Weather Underground's PWS weather feed. (the image below is out of date)



## Weather Activation Temperatures

The Weather Activation Temperatures are used to either activate a temperature dependent cycle or deactivate a temperature dependent cycle. To use these temperatures as activators or deactivators you need to specify the weather dependencies in the cycle. This is done in the cycle setup by clicking Edit on a program within the Schedule. From the program setup window, click the "Weather" Tab and the following fields will be displayed:



## Activate on High Temperature

This dependency allows you to create programs that only activate if the current temperature or the forecasted high temperature meets or exceeds the High Temperature parameter that you entered in the Weather Setup window.

## Deactivate on Cool Temperature

This dependency allows you to create programs that deactivate when the forecasted temperate does not exceed the Low Temperature parameter that you entered in the Weather Setup window.

## Deactivate on Precipitation in Forecast

This dependency allows you to create programs that deactivate when precipitation is cited in the weather forecast. For Yahoo! Weather, this means that precipitation is cited in either the current weather code, the general daily conditions forecast for today, and the general daily conditions forecast for tomorrow. If any of these condition statements include rain, showers, drizzle, or storms, then this dependency will halt a scheduled irrigation event. The condition codes are used to determine if precipitation is forecasted, so these should work in the case of non-English forecasts.

The Yahoo! Weather forecast generally only provides forecast conditions for rain or precipitation in their daily forecast if the chance of precipitation is very high. So, it is a good equivalence for PoP in the 70% or higher range.

The Deactivate on Precipitation dependency can be used for most programs if you live in an environment where the weather feed accurately reflects that forecasted.

## **Deactivate on Rain Gauge Exceeding Threshold**

For use with Weather Underground feeds, selecting this control will block irrigation if the 24-hour rain gauge totals provided within the Weather Underground feed exceed the set threshold. In addition, because the rain gauge totals are saved and rolled to "yesterday" when a new day breaks, this has the ability to hold off irrigation for up to one day after threshold exceeding irrigation has occurred.

This dependency applies only to services that provide a valid rain-gauge number.

## **Deactivate on Forecast PoP Exceeding Threshold**

For use only with weather feeds that provide PoP (probability of precipitation), selecting this control will block irrigation if today's Percent chance of Precipitation (PoP) or tomorrow's forecasted PoP exceed the threshold. This allows OptiRain to hold off on irrigation if rain is forecast.

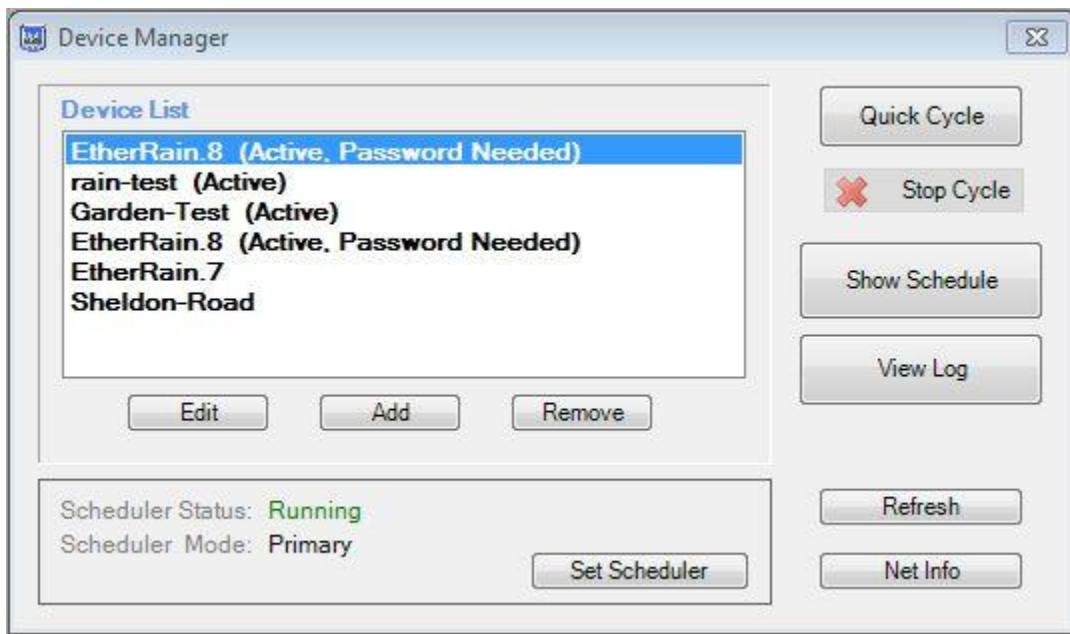
Yahoo! Weather does not provide a PoP forecast, but the general weather condition forecast will include a statement about precipitation if the chances are high. If using Yahoo Weather the equivalent dependency is to use "Deactivate if Precipitation in Forecast" as it will provide similar results in many cases.

This dependency can be used for most programs, if the PoP threshold is set high enough, for example, 50% or above.

# Controlling the Scheduler

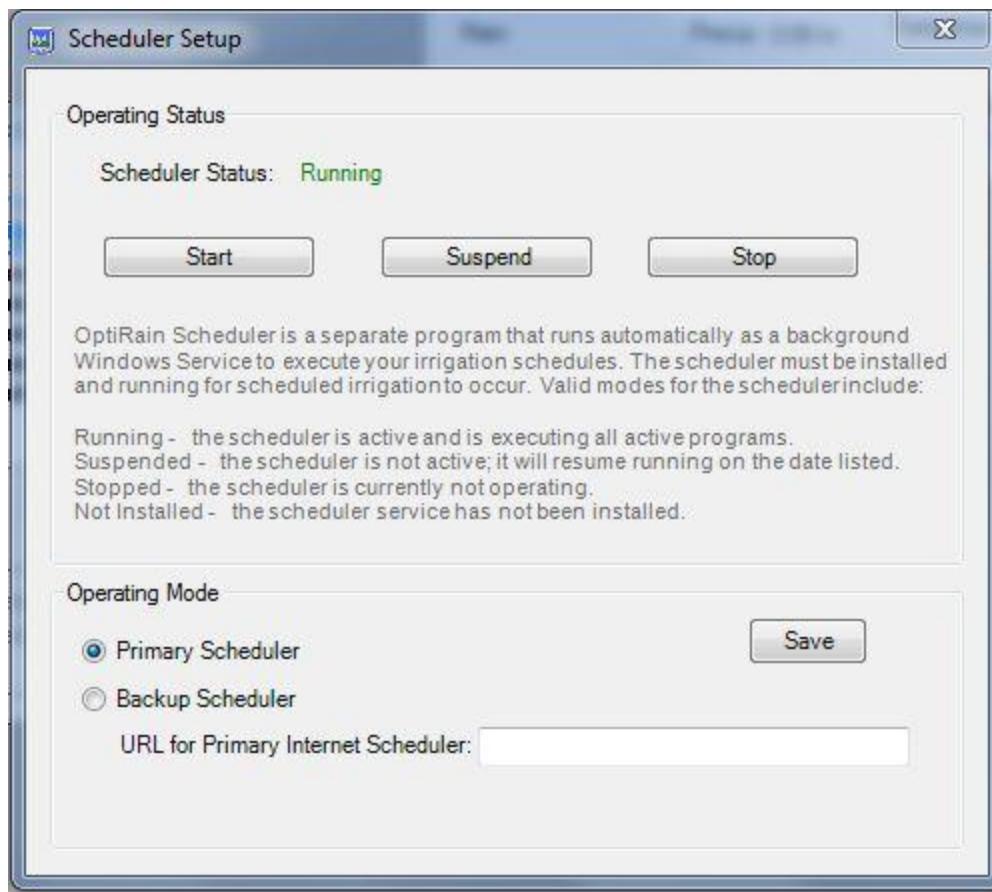
OptiRain Scheduler is a Windows Service that operates in the background. It must be installed separately from OptiRain User. The Scheduler starts automatically whenever the computer is started up or reset.

The status of the Scheduler can be seen from the Device Manager Window. If the word "Running" appears in green in the Window the Scheduler is operating.



The Scheduler should be kept running all of the time. The only time you would want to stop it is if you wished to deactivate all irrigation cycles or if you wanted to uninstall OptiRain.

It's possible to suspend the scheduler temporarily for up to 9 days, and have the scheduler automatically restart after the suspension period is over. This is accomplished by clicking the "Set Scheduler" button from the above Window. The following window will appear:



Click the "suspend" button and then enter the number of days to suspend the scheduler (up to 9 days). The Scheduler is set to automatically start when the operating system starts, unless the scheduler is within a suspend period.

## Computer Power-Saving Modes

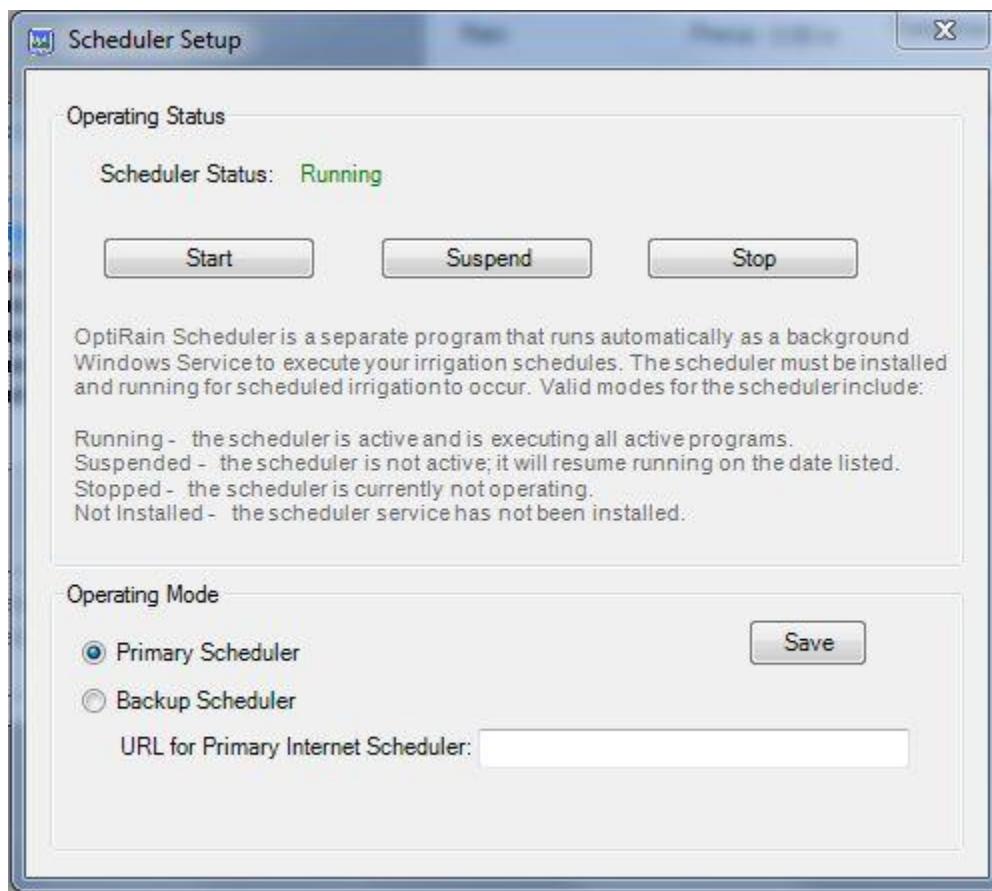
On some computers, the Scheduler may prevent the computer from entering Sleep mode or Hibernate mode.

Conversely, if the computer goes into some type of power saving mode like sleep or hibernate, the Scheduler may not be able to wake the computer up to execute the schedule. It is up the user to determine the computer settings that will allow the Scheduler to execute the desired schedule.

## Setting the Operating Mode

OptiRain can act as the primary scheduler for your EtherRain controller or as a backup scheduler. It can work as a backup if you use an Internet scheduling service for primary scheduling. As a backup scheduler, OptiRain Scheduler would only provide irrigation commands to your controller if it cannot make a connection to your chosen Internet scheduling service.

The Scheduler operating mode is displayed in the Device Manager Window and can be changed by clicking the "Change" button. The Scheduler will only go into backup mode if you enter the URL of your Scheduling service.



# Common Task Guide

This section provides step-by-step instructions for performing common tasks.

## Change Device Name and Password

When the device name or the device password is changed, the change must be made in both the device and the OptiRain database record. OptiRain handles the change process automatically. However, it is best to change only one of these parameters at the same time just to be on the safe side. To change either the device name or password, (just change one of these at a time, with a save in between):

Select the device from the Device Selection list in the Device Manager

The Device Builder window will be displayed.

Change the Name or the Password

Click the "Save" button

OptiRain will respond with a series of dialog boxes prompting you as to whether you are sure you want to perform this action. Respond with yes, or OK.

### Device Names

Device names are limited to standard alphanumeric characters. Special characters, including the SPACE character are not allowed in device names. The period character and the underline character are allowed.

If you enter a name that contains a disallowed character, OptiRain will notify you and ask you to enter a different name.

### Passwords

Passwords are limited to 8 alphanumeric characters.

After changing a password, it is a good idea to print out a device configuration. The device configuration print out prints out the password in plain text for your records. If you lose the password, you'll have to disassemble the EtherRain to reset it.

# Arrange Programs on Your Schedule

The programs within an irrigation schedule can be arranged to match your own preferences.

Programs can be moved up within the schedule by clicking the Up-arrow button located in the top right corner of each program summary block in the Schedule window.

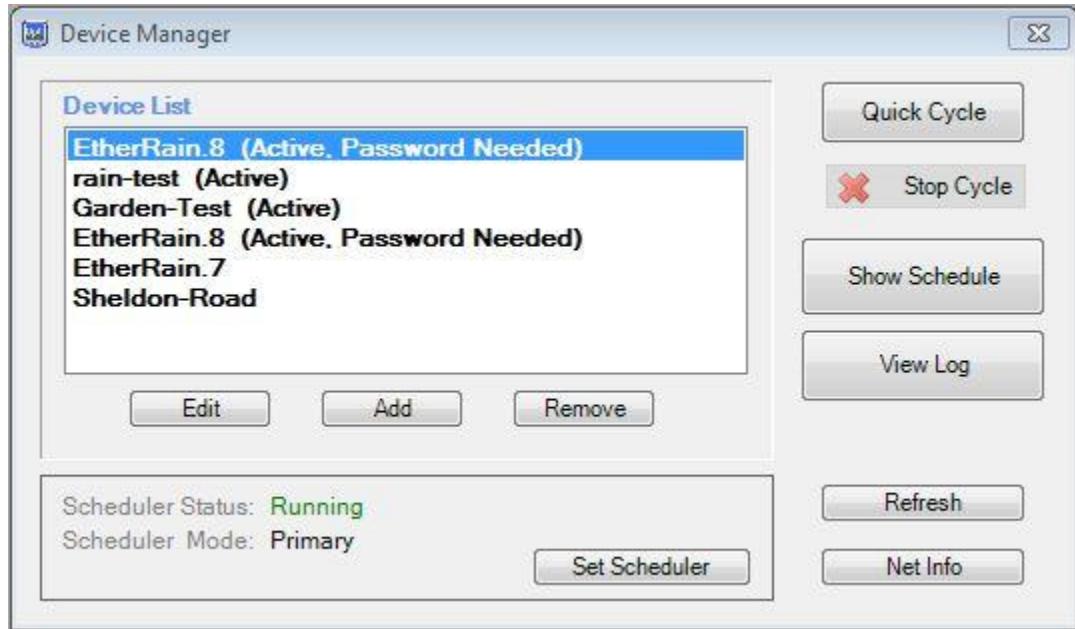


The arrow on the topmost program summary block is disabled.

## Emergency Cycle Stop

A cycle can be stopped at any time by selecting a device and clicking the "Stop Cycle" button in the Device Manager Window.

### Device Manager Window



# Printing the Irrigation Schedule

The Irrigation Schedule can be printed out from the Schedule Window.

To print out the Irrigation Schedule:

- Select a device from the Device Selection List in the Device Manager
- Click the "Show Schedule" button
- Click the "Print" button located at the top of the page.

The irrigation schedule will be displayed using the application that opens text files on your computer. You can then print out the schedule using your application's print functions.

# Reading the Irrigation Commands Log

A log is kept of all scheduled irrigation commands sent to the controllers. The Log is accessible by clicking the "View Log" button from the Device Manager window.

The log contains a record of attempts to send an irrigation command to a device. Generally, an irrigation command is sent to a device about 5 to 10 minutes ahead of its scheduled start time. When an irrigation command is sent to the controller the controller responds with a status. Usually the command is accepted and the irrigation command is noted in the log. Occasionally the controller might indicate it is busy or waiting, or might indicate a "rain" status. In these cases the results are noted in the log and the command is resent once a minute or until the cycle start time has been exceeded.

When a command is accepted by the controller, the scheduler determines when to send a status command to follow up on the irrigation command. The status command provides results status to record the results of the completed irrigate command to the log.

The most recent command is entered at the top of the log

## Typical Irrigation Results Log Entry

When reading the log, it is typical to see a sequence like this:

```
12/21/2019 9:07:28 PM N:rain-test>Weather Test; Cycle STATUS:OS- RD Result Code- OK(8)  
12/21/2019 8:48:21 PM N:rain-test>Weather Test; Cycle RUN:(6)5:0:5:0:0:0:0 W: R:OK-CMD Delivered
```

This sequence indicates that at 8:48 PM, the controller accepted an irrigation command from OptiRain. The command was sent to the controller named "rain-test" and the program name was "Weather Test." The cycle indicates that zones 1 and 3 will run for 5 minutes each. The number in parenthesis indicates the number of minutes that the controller will delay before starting the irrigation. The start time for this program is 8:55 pm; the command was sent to the controller at 8:48, so with the delay of 6 minutes, the

controller will start the command at 8:56 pm (close to the 8:55 pm start time). After the irrigation command will be the status as received from the controller.

The topmost log record shows that at 9:07 the scheduler checked the controller for a status, and the controller returned a result code of OK(8) indicating that the controller ran the complete command. An EtherRain 7P controller will return a result code of OK(7).

## Irrigation Block Log Entries

If a program has weather conditions attached to it, various irrigation command blocked records will occur depending on the weather conditions. The irrigation block is noted in the log along with the reason for the block. Here are a few typical weather block log entries:

12/21/2019 9:51:00 AM N:rain-test>Main (1); Cycle BLOCK:PoP threshold exceeded (90|100=>60)

12/18/2019 8:45:21 AM N:rain-test>Early Morning; Cycle BLOCK:Rain gauge threshold exceeded (0.11=>.02)

12/15/2019 8:26:48 PM N:rain-test>Weather Test (1); Cycle BLOCK:Shared local rain sensor reporting Rain.

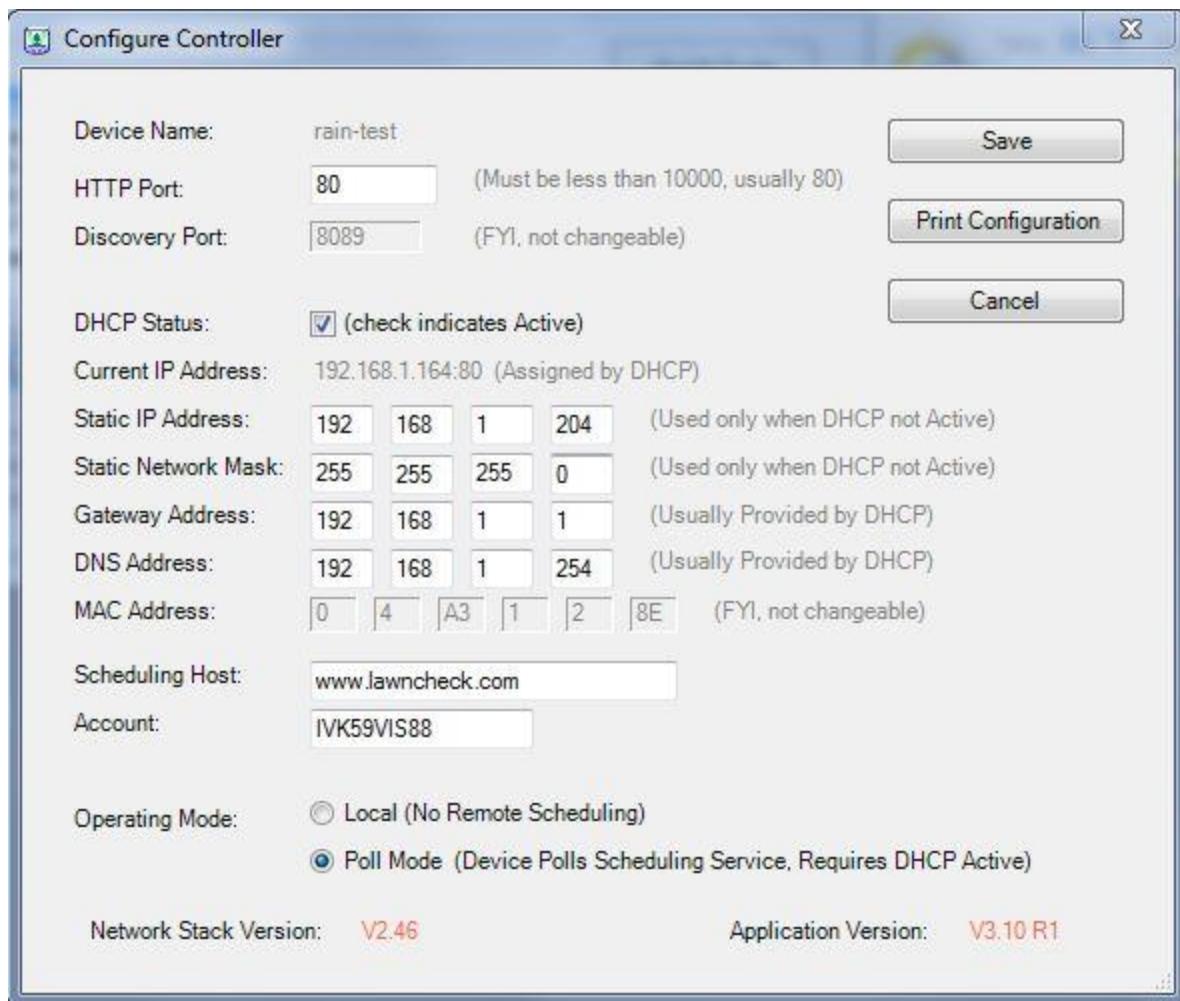
12/15/2019 1:43:22 PM N:rain-test>Weather Test (1); Cycle BLOCK:Current Conditions-Chance of Rain

## Device Network Configuration

OptiRain is able to configure the operating parameters of an EtherRain controller. To access the device configuration window:

Select an active device from the Device Manager window  
Click the Edit button located under the Device Selector list  
The Device Builder window will be displayed  
Click the "Configure Device" button on the Device Builder Window

The Device Configuration Window will be displayed. From this window you can configure the device and print out the configuration. It is recommended that the configuration be printed every time the password is changed or whenever any parameter is changed.



When you receive a new EtherRain controller, it is preconfigured with settings that allow it to be usable out-of-the-box in many cases. However, many users may need to alter the parameters of their EtherRain controller so that it works within their network.

It is recommended that EtherRain be used in a network that assigns addresses dynamically using DHCP.

## Default parameters include:

### DHCP: Active

This means the controller will receive a network address from a DHCP server on your network. Most Internet gateways have a DHCP server. If your network does not have a DHCP server the device will use its default address.

### **Default Static IP Address**

The default address is:

192.168.1.204

### **The default network mask is:**

255.255.255.0

These default address will be appropriate for many networks. If your network uses a different network address, you'll need to change these settings to prevent problems within your network.

### **Select Operating Mode**

The standard operating mode selection for use with OptiRain is Local.

## **Connecting EtherRain**

Connecting up EtherRain requires the connection of the network, the valves and the power.

All connections are located on the front panel of EtherRain. The network connection is a standard Ethernet connection.

The power is 24VAC from a standard sprinkler valve controller transformer.

For more precise information about connecting valve and power wires to EtherRain please refer to the connection guide that came with your controller. The connection guides are also available on the QuickSmart EtherRain web page.

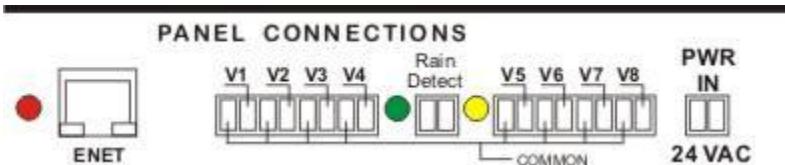
## **Connecting the Valves**

EtherRain provides industrial grade connectors and sockets for connecting both the valve wires and the power. To connect the valves, first remove the green rectangular plugs from the Ethernet unit.

These plugs work by inserting a bare wire end into the front of the plug and then tightening down the screws at the top of the plug. The screws are very miniature and require a very small standard slot screwdriver. The screw must be turned until it is tight. The wire will then be held in place very securely.

## Which Wire Goes Where?

A diagram of the front panel is shown here:



### Connecting the Commons

You can see from the diagram that the first wire hole on the left is for a ground or common connection, and that every other hole is also a ground or common connection. The EtherRain controller provides connections for 8 ground wires, but in common practice only one or two common wires are present. You need to locate the common wire and connect that wire to any of the holes in the plug that correspond to the ground or common in the diagram.

### Connecting the Valve Wires

You need to locate the wires that go to the valves that correspond with the zones that you have named. You'll note that Zone 1 is connected to the second wire hole from the left , and Zone 2 is the fourth hole continuing through the zones.

### Connecting the Power Wires

The power is supplied by a 24VAC sprinkler valve transformer. Common transformers from RainBird and others work well.

The power is supplied by a transformer and you will have two power wires and possibly one ground wire. The ground wire is not used and should be clipped to avoid accidental shorting. While making sure that the transformer is not powered on, connect the two power wires into the power connector, one wire into each connector hole, in any order.

# Irrigation Topics

## Year Around Irrigation Schedule

With OptiRain it is possible to develop a Year Around Irrigation Schedule. This eliminates the twice-yearly hassle of turning the controller on in the spring and turning it off in the fall as is required in many climates.

Setting up a full year schedule is done in the cycle setup phase by selecting the months of the year that you want to have a cycle active. In addition to selecting the active months you can also specify a scale factor to reduce the amount of water applied during some months.

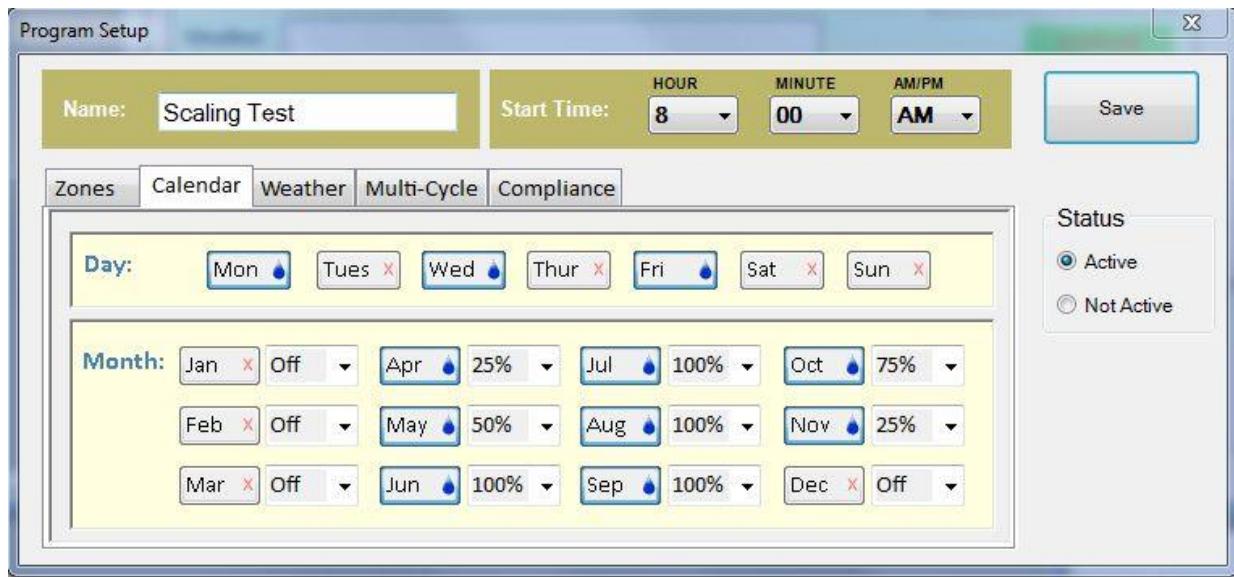
### How to Use Scaling

The best way to use the scaling feature is to determine the average water requirements for the warmest months of the year and set the zone minutes to provide enough water to keep landscape healthy during the warm months. When you select these warm months, select a scale factor of 100%. This is the default scale factor.

Next select the months that are not the warmest but still require irrigation. Generally, these are spring and fall months. For these months select a scaling factor below 100%.

### Example

In Northern California, the warmest months are: July, August, September. The rains stop in March, and are intermittent in March and April. Shown here is an example irrigation cycle calendar for this climate:



In addition, weather dependent cycles can be created so that if extra warm weather hits an extra cycle can run. Or if the weather is unseasonably cool, cycles can deactivate.

## Rain

With OptiRain, irrigation can be reduced automatically when precipitation is in the area if weather data is used. For example, if the Yahoo! Weather feed is active, OptiRain will retrieve a new forecast prior to every irrigation event. If the irrigation cycle is setup with the "Deactivate on Precipitation in Forecast" option, and if the weather feed provides a forecast with a current or forecast codes indicating precipitation, OptiRain will not run the cycle.

In addition, if no weather feeds are being used, the EtherRain controller itself has an input for a low-cost rain sensor input. If the rain sensor is used, and rain occurs, the EtherRain controller will cut off irrigation and return a status of "Rain" during wet weather.

## Irrigation for Conservation

Across the world fresh water is becoming more of a scarce resource. In developed countries water rates are going up as water resources are being depleted by growing populations and changing environments and the cost for producing and distributing clean water increases. In extreme cases communities are now turning to expensive methods of supplying water, such as desalination plants, to meet growing need.

In California, outside irrigation accounts for 50% of water use. How much of this is wasted? Who knows? OptiRain offers a low-cost way to conserve water, while also being easier to use than alternative method.

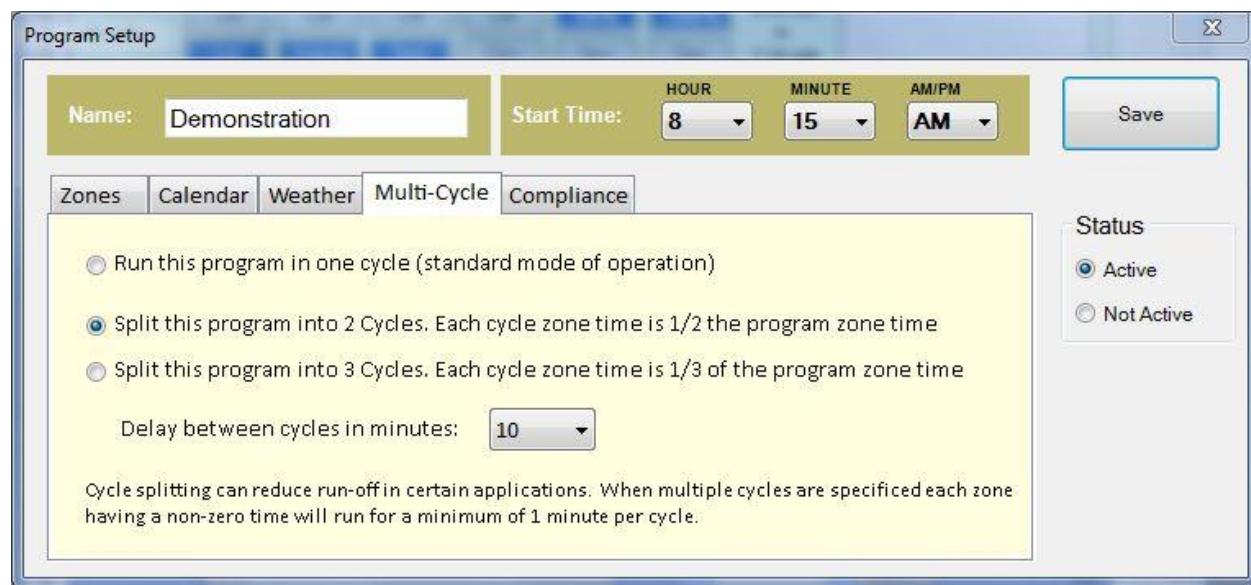
Here are some ways that OptiRain can help you in the fight to conserve water, without negatively impacting your landscape by making it easy to implement weather dependent cycles and by making it easy to reduce runoff through the use of split-cycles.

## Seasonal Scaling

Most geographies have seasons that have an effect on the amount of irrigation water required for healthy landscape growth. OptiRain offers an easy way to match irrigation needs with monthly seasonal temperatures. See the above section for more information and an example.

## Split Cycles

Many landscapes are sloped, and they can't absorb water as fast as applied. The result is runoff. By splitting a cycle into two, the landscape has more time to absorb the irrigation water, thus helping to eliminate runoff. OptiRain's multi-cycle feature makes it easy to split a program into 2 or 3 cycles with each cycle running 1/2 or 1/3 of the scheduled time. This can be done using the Multi-Cycle setup option:



## **Weather Dependent Cycles**

With weather dependent cycles you can reduce your standard cycle on-time minutes dramatically. When the weather becomes hot, extra cycles can automatically turn on to provide more water when needed. If the weather is cooler than normal, cycles can automatically turn off. This type of scheduling minimizes water use. It also minimizes overwatering.

## **Weather Cycle Programming**

If weather data is used to control irrigation, a schedule can be setup that provides more optimum quantities of irrigation. This results in less water waste, lower watering bills, and healthier landscapes.

Most cycles can be configured with the "Deactivate on Precipitation" option. In addition, it is worthwhile to develop cycles that are designed to only activate in hot weather. This allows you to reduce the irrigation quantity of your standard cycle, because you don't have to overcompensate to handle hot spells.

It is also worthwhile to develop a cycle that deactivates when temperatures are lower than normal, this again would allow you to reduce on-time for a standard cycle, allowing the "Deactivate on Low Temp" cycle to supplement during times of normal weather. If weather became unseasonably cool for a while, the Low Temp cycle would deactivate.

### **Examples:**

Example 1. No weather data usage.

Cycle 1: Standard Cycle. Total Time: 60 minutes (combined zone time)

Example 2. Use of Hot Cycle

Cycle 1: Standard Cycle Total Time: 40 minutes (combined zone time)

Cycle 2: Weather Cycle, Activate Hot: Total Time: 20 minutes (only activates on hot temperature data)

Example 3. Use of Hot Cycle and Cool Cycle

Cycle 1: Standard Cycle Total Time: 30 minutes (combined zone time)

Cycle 2: Weather Cycle, Deactivate Cool: Total Time: 10 minutes (deactivates only when weather is cooler than normal)

Cycle 3: Weather Cycle, Activate Hot; Total Time: 20 minutes (only activates on hot temperature data)

Weather dependent cycles are easy to setup and can more optimally match irrigation needs with the climate, without manual intervention.

# Troubleshooting

Solutions to uncommon problems.

## Device Doesn't Show Up in OptiRain

If the controller does not show up in the device selection list in the Device Manager Window, check the following:

Does the Controller have power? Is the Red Power LED lit up?  
Was the network cable attached before power applied to the controller?  
Is the Controller connected to the same network as the PC?  
Is the PC connected to the network?

If those checks are ok, then perform a power cycle on the controller: Remove power for five seconds and re-apply power. Watch the yellow and green LEDs located at the network connector. They should be flickering to show network activity. Click the "Refresh" button located in the Device Manager Window.

If the LEDs are illuminated and the device doesn't show up it is most likely that it is not configured correctly for your network. It may not be getting a network address if DHCP is used, or the static address does not fit the address scheme of your network.

If the EtherRain controller shows up in ZonePopper or EtherRain Admin, but not in OptiRain then the issue is most likely a firewall or spam guard that is blocking the discovery port. Temporarily remove any firewall or any anti-virus software; reset the computer and see if the controllers show up.

## No Communication Between OptiRain and Controller

If a controller shows up in the Device Selection List in the Device Manager Window but OptiRain is Unable to Communicate with the device try manually power cycling the controller. Remove power from the controller for 5 seconds and then re-apply power.

If the device shows up on the Device Selector list, but you are still unable to communicate with it through OptiRain then it is most likely because the Password that you have in the database field does not match the password stored in the unit.

To try different likely passwords, download and install the EtherRain Administrative Utility and try to reach the configuration screen by entering different likely passwords.

The default password for new and reset devices is: pw

Also, if you have printed out a device configuration in the past, that configuration would have the last known password for the device. Configurations are stored in the install directory with filenames made up of the devicename\_config.txt

If you cannot guess the password you will have to manually reset the device.

## Forgot Password

If you've forgotten the password for a device you can retrieve it if OptiRain is able to communicate with the device through its stored password. To retrieve the password:

Select the device from the Device Selector List in the Device Manager

Click the Edit button located under the device list.

The Device Builder Window will be displayed.

Click the "Configure Device" button located within the Device Builder window.

click "Print".

The password will be output to a file and the file will be displayed on your screen.

If you haven't changed the password, the default password is: pw

## Sample Device Configuration Printout:

Device Configuration for: EtherRain.8 8/11/2007 10:54:34 AM

MAC Address: 0:4:A3:1:0:0

Scheduling Service URL/Address: www.lawncheck.com

Scheduling Service Account Number: abc12def34

Operating Mode: (L) Local Mode

DHCP Status: Active

Current IP Address: 192.168.1.101:80 (Assigned by DHCP)

Default/Static IP Address: 192.168.1.204

Default/Static Net Mask: 255.255.255.0

Gateway Address: 192.168.1.1

DNS Address: 68.94.156.1

HTTP Port: 80

Device Password: pw

Network Stack Version: V2.46

Application Version: V3.05 R1

# Reset Password

If you've forgotten a device password and OptiRain cannot communicate with the controller then you'll have to perform a hardware reset to reset the controller back to factory settings.

The factory settings are:

DHCP: Active

Password: pw

Static IP Address: 192.168.1.204

Net Mask: 255.255.255.0

After a reset you may need to change the static IP address and netmask to match the network address of your network.

## Hardware Reset Instructions

Hardware reset requires opening up the EtherRain device. Opening up the EtherRain device voids any remaining warranty.

To perform the reset:

- Disconnect the Power Wire and all Valve wires. Make sure no power is coming into the unit.
- Loosen the four screws located at the bottom corners of the unit.
- When the screws are out, carefully pull the top off of the controller.
- Note the location of a small jumper located on the back edge of the relay board (the board housing the 8 black rectangular objects).
- Install the jumper so that it covers the two pins (shorts the pins).
- Put the cover on temporarily.
- With the power off, attach the Power connector to the device.
- ATTACH the network cable.
- Apply power for about 15 seconds then remove power.
- Remove the power connector.
- Remove the cover, move the jumper to it's original location.
- Reassemble the unit.

The device will be reset with the factory password which is pw. DHCP will be active. You may now need to re-configure the network address.

# Weather

Much of the information provided in this section has already been covered previously within this document. This is a capstone section to focus on all of the weather-related aspects of OptiRain and the benefits that weather dependent irrigation can provide.

This section describes weather feed providers, how OptiRain makes weather-based decisions, and how to read the weather log.

## Weather Control

A primary feature of OptiRain is weather control that is easy to setup and use. The weather control included in OptiRain provides a way to optimize your irrigation allowing you to automatically moderate the amount of water you apply depending on the weather.

### Weather Sources

OptiRain for Windows current supports these weather feeds:

Yahoo! Weather

Weather Underground PWS contributors Feed

### Yahoo Weather

Yahoo Weather is available worldwide. Local weather can be specified using Yahoo's geographic location system called WOEID (Where on Earth ID), also worldwide. A local WOEID can be found by searching on the web by the following search term: woeid lookup

### Weather Underground

Weather Underground offers a weather feed called the PWS contributors feed. Those who sign up to provide data to their network can receive an access key to receive limited data from their network. OptiRain supports this feed. Simply enter your access key and select a weather station ID.

## **Weather Data Processing in OptiRain**

OptiRain keeps weather records for three days: yesterday, today, and tomorrow.

OptiRain "rolls" weather data at midnight. The data from "today" including daily condition codes, rain gauge, and high and low temperature is rolled to "yesterday" at the first weather check after midnight. OptiRain is capable of using the yesterday, today, and tomorrow data when making a decision on whether to irrigate or not. The decision criteria are provided below.

### **Use of Local Rain Sensor**

Retrieval of reliable weather station might allow effective operation of the controller without need for a local rain sensor. However, a local rain sensor is recommended for most installations to ensure irrigation does not occur when it is raining.

Use of forecasted and saved weather data, combined with a local rain sensor is optimal. Stored data can prevent irrigation from running due to rain occurring yesterday. Forecasted data can be used to prevent cycles from running when there is a high chance of rain occurring for the current day or the next day.

## **Decision Criteria for Weather-based Irrigation**

This section explains how OptiRain makes its weather-related irrigation decisions. Note: if you are using a local rain sensor (recommended), the rain sensor will automatically block any programs if rain is detected when the command is sent or if it starts to rain while a cycle is running.

The rain sensor is only active when it is raining or shortly after. Using weather data can provide desirable irrigation blocks after rain has moved away (for example if using the rain gauge data or conditions forecast data), or before rain arrives (for example by using the forecast blocks (precipitation in forecast or PoP) thereby providing the potential to further reduce unnecessary irrigation cycles before and after rainfall.

### **Activate on Warm Weather “Hot Cycle”**

A hot weather cycle will run if any of the following events is true:

Yesterday's stored Hi temperature is equal to or greater than the Hot Weather Threshold

Today's Hi temperature or current temperature is equal to or greater than the Hot Weather Threshold

Tomorrow's forecast Hi temperature is equal to or greater than the Hot Weather Threshold

If a hot weather cycle is run it is noted in the log. Blocked hot weather cycles are not noted in the log given this is the likely normal operation.

## **Deactivate on Cool Weather**

A cycle that has cool weather controls assigned to it will be blocked on the following conditions:

The forecasted high if the day is less than the cool weather threshold.

NOTE: the current temperature is not used in this decision. A cycle will run if the current temperate is lower than the cool weather threshold as long as the forecasted high of the day is above the cool threshold.

A deactivation on cool weather event is noted in the log.

## **Deactivate on Precipitation in Forecast**

A cycle that is set for “Deactivate on Precipitation in Forecast” will block under the following conditions.

Yahoo Weather: If at the time that the cycle is to run, a condition code associated with precipitation is provided by the feed for either a current condition or a daily forecast condition for today or tomorrow, then a cycle event will be blocked. In addition, the cycle will be blocked tomorrow if the last daily forecast condition reading for today includes precipitation. The “today” condition code is kept and rolled over into a “yesterday” reading. If the program is blocked the reason is noted in the commands log.

Weather Underground Weather: if the current condition text includes “rain” then the cycle will be blocked. NOTE: this might not work if the feed is provided in a language other than English.

A deactivation on rain event is noted in the log.

## **Deactivate on Rain Gauge**

This option is valid only when the Weather Underground feed is selected. A rain gauge threshold above 0.0 must be entered. The cycle will be blocked if the total recorded rain gauge amount is greater than the threshold. NOTE: Two days’ worth of rain gauge readings are used: yesterday and today. These amounts are added and compared to the threshold to determine if the cycle should run.

A deactivation on rain-gauge threshold is noted in the log.

## **Deactivate on Probability of Precipitation**

This option is valid only when the Weather Underground feed is selected. Probability of precipitation is abbreviated as PoP.

When a PoP threshold has been selected, and the “deactivate on PoP Threshold” control is applied to the program, the cycle will be blocked if the current reading of PoP OR tomorrow’s forecasted PoP, as obtain from the most recent weather feed, equals or exceeds the set PoP threshold. Note that both today’s PoP and tomorrow’s PoP are considered for this block test.

A deactivation on PoP threshold event is noted in the log.

NOTE: A local rain sensor that detects rain will always block a cycle. The block will be noted in the log.

## **Reading the Weather Log**

OptiRain keeps a historical log of the weather. Weather is read once every 6 hours and stored in the log. While a weather feed is retrieved immediately before an irrigation cycle is sent (if weather is activated that is) this reading is not logged. The weather log can hold data for about 20 days.

The OptiRain Scheduler program logs the weather, so if your weather log is not providing readings consistently, make sure your computer is not going into sleep mode.

### **Weather Log Format**

The weather log format varies based on the feed that is being used.

#### **Basic Log**

The first two columns are the date and time the log record was entered.

The next column is the weather feed location ID or station ID followed by ">>". For Yahoo weather it will look like:

02/28/2019 14:20 woeid: 250055 >>

The current temperature reading and current forecast Hi and Lo temperatures are then provided.

The continuation of the log record will vary based on the weather source:

## **Yahoo Weather log**

If the weather source is "Yahoo Weather" then the following information is included in the log:

Current conditions text  
Daily conditions text for today  
Daily conditions text for tomorrow

Example log for Yahoo Weather:

02-28-2019 14:20 woeid:2502265 >>Temp:56 H:57 L:46 ->Now: Cloudy; Today: Cloudy; Tmrw: Showers

In the above log line, "Tmrw" is short for "Tomorrow."

## **Weather Underground Weather log**

If using the Weather Underground feed, then the following additional information is provided in each log record:

Rain Gauge: (denoted as RGauge) a value for yesterday's rain gauge reading and today's rain gauge reading (y- /t- ).

Probability of Precipitation: (denoted by PoP) today's PoP reading and tomorrow's PoP forecast (t- /f- ).

# **Using the Yahoo Weather Feed**

Yahoo Weather is available worldwide. A local weather feed can be obtained by specifying a Yahoo geographic location ID called WOEID (Where on Earth ID), also worldwide.

For more information on Yahoo WOEID, search: Yahoo WOEID

Yahoo weather provides dependable current day and next day information including current temperature and forecast daily Hi's and Lo's. It also provides a current condition code and daily condition codes for both today and tomorrow.

The current conditions code reflects the conditions at the time of reading. The daily conditions code reflects the primary outlook for the day. For example, at 10:00 am the current conditions could be "cloudy" while the daily conditions code could be "showers." All three of these conditions codes are used by OptiRain to determine if a precipitation block is enacted. See below for more information.

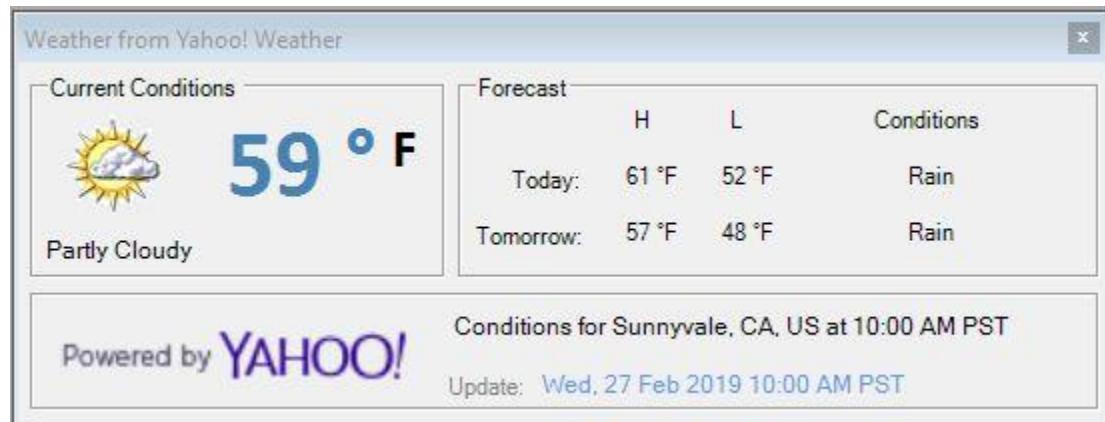
## **Using Yahoo! Weather**

To use Yahoo! Weather, the PC that is running OptiRain must have continuous Internet access.

Click "Weather" on the main menu bar, to view Weather Setup window. Check the "Use Yahoo Weather" box, and then enter a location code or zip code.

On the weather page, enter in your WOEID. Check the "Use Metric Units" checkbox only if you want to specify your threshold parameters in Centigrade.

Check the "Activate Weather Fetch" box and then click save. The weather display window should provide data immediately. Here is an example display:



Notice: in this display you see that the current conditions show partly cloudy. If your irrigation program was set run at this time without any precipitation or temperature weather blocks then it would run. If you used the dependency of "Block on Precipitation in Forecast" however your program would be blocked. You can see that the forecast for today and tomorrow call for rain. At the time this image was captured it had been raining for two days, with more to come, so obviously we would usually not want to run irrigation at this time.

## Using Weather Underground:

Weather Underground offers an access key to weather station owners who contribute to their network. Contact Weather Underground to request a key

To use Weather Underground, the PC that is running OptiRain must have continuous Internet access.

To use Weather Underground, click "Weather" on the main menu bar, to view Weather Setup window.

Check the "Use Weather Underground" box, and then enter a Weather Underground weather station ID. The station IDs can be found from the Weather Underground WunderMap®.

After entering a weather station ID, you must also enter your PWS access key in the field provided. Check the "Use Metric Units" checkbox only if you want to specify your threshold parameters in Centigrade and millimeters (for rain gauge).

Check the "Activate Weather Fetch" box and then click save. View the weather display box to ensure you are receiving a weather data. You should receive data immediately. If not check your station ID and your PWS key entries. Here is an example weather display window:

