RAIN BIRD®

Installation and Operation Guide
Controller Unit IM

Warning!

Important safety information and warning messages appear throughout this manual. To ensure correct operation and to avoid additional expense, read this manual thoroughly before you begin installation.

"WARNING: A CIRCUIT BREAKER OR CUTOFF SWITCH IS TO BE PROVIDED IN THE FIXED WIRING TO ISOLATE THE CONTROLLER"

"ATTENTION: UN DISJONCTEUR OU UN IMTERRUPTEUR DOIT ETRE INSTALLE SUR LE PRIMAIRE POUR ISOLER LE PROGRAMMATEUR"

"MEMORY IS RETAINED BY A BATTERY WHICH IS TO BE DISPOSED OF IN ACCORDANCE WITH LOCAL REGULATIONS"

"LA MEMOIRE EST MAINTENUE GRACE A UNE BATTERIE RECHARGEABLE A DISPOSER SELON LA REGLEMENTATION LOCALE"

Caution icons
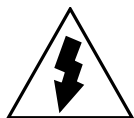
The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

L'éclair avec is symbole de la flèche, placé dans les limites d'un triangle équilatéral est prévu pour avertir l'utilisateur de la présence de "tension dangereuse" non isolée dans l'enceinte du produit qui pourrait ëtre d'une importance suffisante pour présenter un risque d'électrocution aux personnes.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

Le point d'exclamation dans un triangle équilatéral est prévu pour avertir l'utilisateur de la présence d'instructions importantes pour les opérations et l'entretien (service) dans les manuels fournis avec l'appareil.

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Welcome to Rain Bird

Thank you for purchasing your new state-of-the-art Rain Bird IM controller. For more than six decades, Rain Bird has led the irrigation industry in meeting all of your water management needs by providing the highest quality products and services available. Your new Rain Bird controller is designed to give you a lifetime of on-site watering control.

The Rain Bird IM Controller

The Rain Bird IM is a stand-alone controller. Its easy-to-use, built-in computer offers seven different programs and up to 48 watering stations.
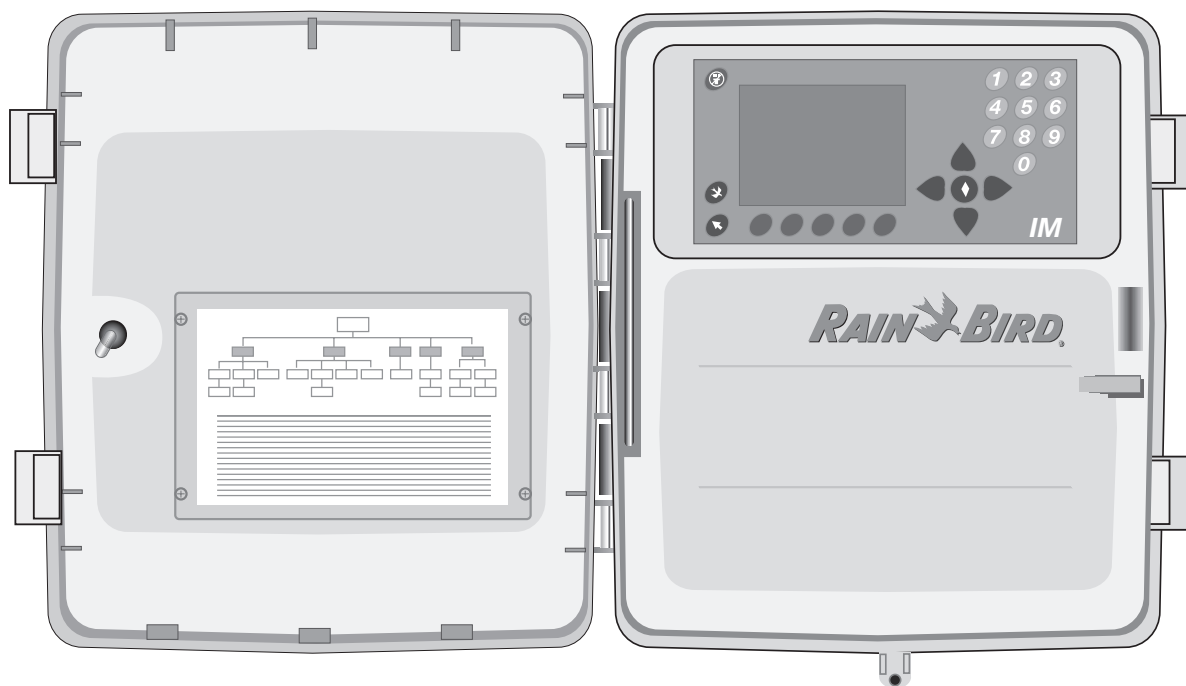
Introduction, continued

Special Features

The Rain Bird IM controller comes as a wall-mount model with 12 stations and three switched sensor inputs. Stations 13 through 48 and sensors 4 through 12 may be added by installing standard modules into this basic unit. All Rain Bird IM models have the following special features:

- Easy-to-use display

- Flow monitoring

- Time, volume, and ET programming

- Seven different programs, each with up to eight start times

- Independent station programming

- Standard and looping programs

- Convenient program review and program status reports

- Option to use any and all programs for non-irrigation applications such as lights, fountains, etc.

- Test programs

- Water Budgeting from 0 to 999% in increments of 1%

- Rain Delay from 1 to 99 days

- Option to set a Water Window

- 365-day calendar with advanced scheduling options for watering cycles

- Option to set any day of the year as a non-watering day

- Odd/Even, Cyclical, and 14-day schedules

- Up to 8 overlapping stations possible

- Station run time from one second to 24 hours

- Up to 12 switched or pulse sensors, individually assignable to stations or master valves

Introduction, continued

- Water usage log and optional event logging

- Program and time keeping during power outage

- Choose from English, Spanish, and French language display

- Choose English measurements or SI metric

- Cycle + Soak™ feature for water conservation and erosion control

- Three levels of password protection

- UL, CSA, CE, TUV, NEMA-4 rated weatherproof cabinet, NEC Class 2, FCC Class A and C-Tick certified

Packing List

Please check to make sure that you have all the items on the list. If any item is missing or damaged, contact your Rain Bird distributor.

✔ Pre-assembled wall-mount controller

✔ Bag of mounting hardware

✔ Installation and Operation Guide

✔ Mounting bracket
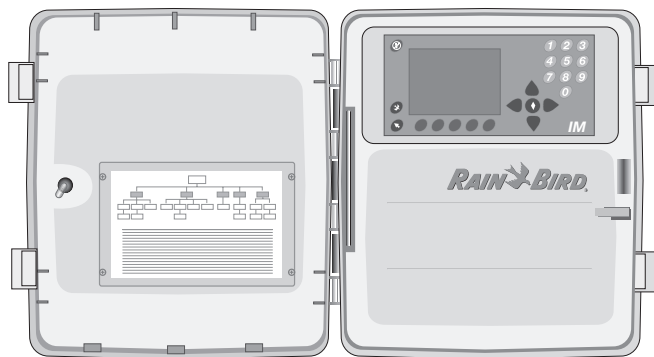
Chapter 1: Installing the Controller

This section of the manual explains how to mount your wall-mount controller and make the connections to the controller.

Follow these instructions to install a wall-mount controller.

Warning! Do not let water or other liquids come in contact with any part inside the plastic cabinet.

Warning! This controller must be installed in compliance with local electrical codes.

Choosing a Location

When choosing a location to install your wall-mount controller, please consider the following:

✔ Select an area, protected from vandalism, where the user can easily reach the controller. We recommend placing the controller in a utility room.

✔ Choose a flat, stable, vertical surface where you can mount the controller at eye level. Allow sufficient conduit clearance for the electrical and valve connections at the bottom of the cabinet. See the illustration on the next page for details.

✔ Allow 18 in. (46 cm) minimum clearance for the hinged cabinet door to swing fully to the left.

See the illustration on the next page.

Chapter 1: Installing the Controller, continued

18" (46 cm) minimum

15³/₄" (40,0 cm)

Cabinet depth 8³/₈" (21,3 cm) →

17" (43,2 cm)

To fuse box

Conduit to controller

120 Volts AC or 230 Volts AC wiring in conduit and housing

Locate for easy access and for comfortable viewing

← Wall

Floor

Valve wiring in conduit
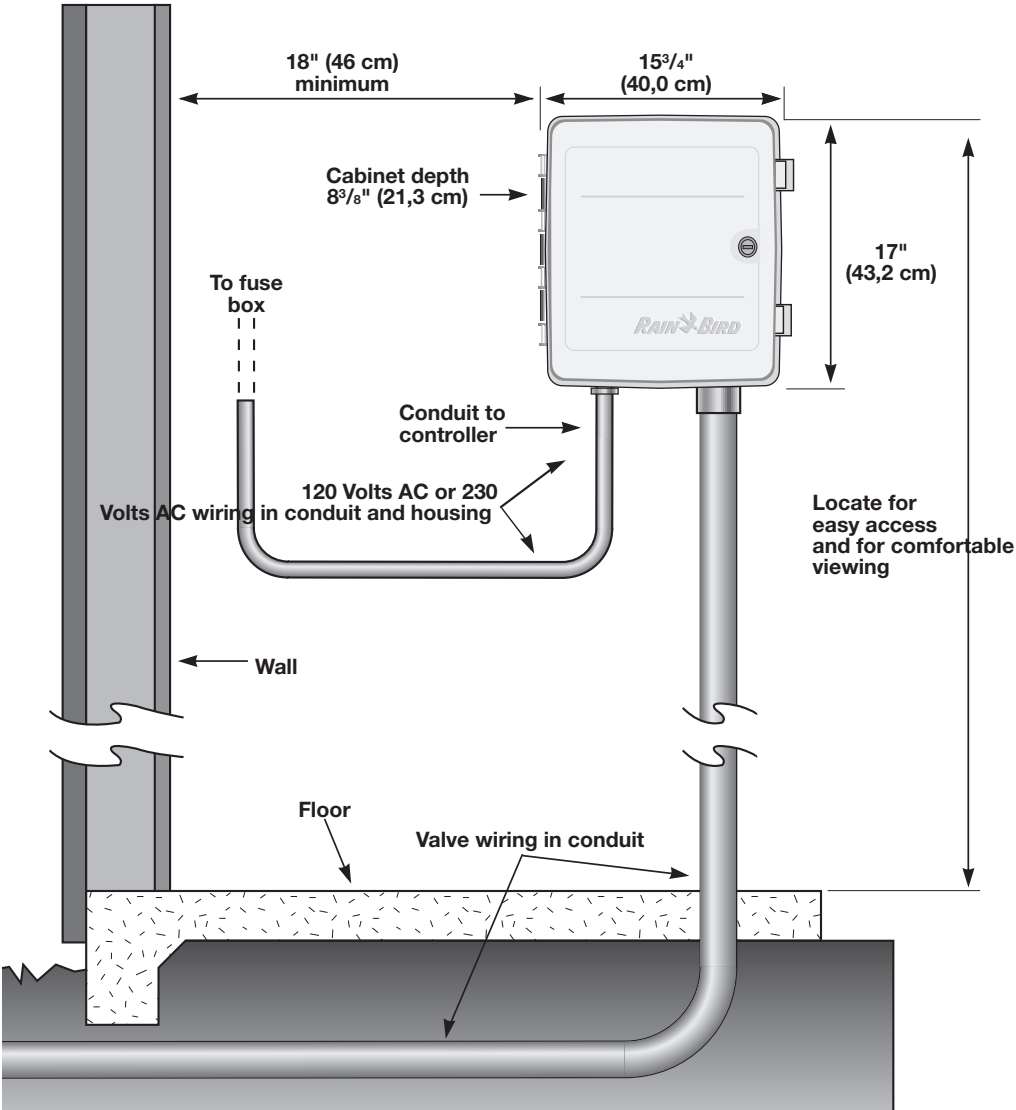
Typical wall-mount installation

Chapter 1: Installing the Controller, continued

What You Will Need

Before you begin installation, you will need the following tools:

- ✔ Phillips Head Screwdriver
- ✔ Slotted Thin Blade Screwdriver
- ✔ Wire Strippers
- ✔ Lineman's Pliers – Diagonal Cutter
- ✔ Needlenose Pliers
- ✔ Tape Measure
- ✔ Marking Pencil
- ✔ Electric Drill (or Hammer Drill if installing in masonry or concrete wall)
- ✔ Nut Driver

Chapter 1: Installing the Controller, continued

Mounting the Cabinet on the Wall

1. It is easiest to install upgrade modules before mounting the controller on the wall. If you have optional feature modules to install, such as additional sensor cards, see the instructions that come with the module. For more information, see Chapter 9, Installing Upgrades.

2. Place the mounting bracket onto your mounting surface at a convenient height and mark the three drill holes.

3. Drill the holes and mount the bracket with the mounting hardware supplied.

Note: The mounting materials and specific screws you need will vary according to the kind of mounting surface (i.e., wood, cement, masonry, drywall, etc.).

4. Slide the controller cabinet onto the mounting bracket by placing the lip on the back of the cabinet above the lip on the mounting bracket.
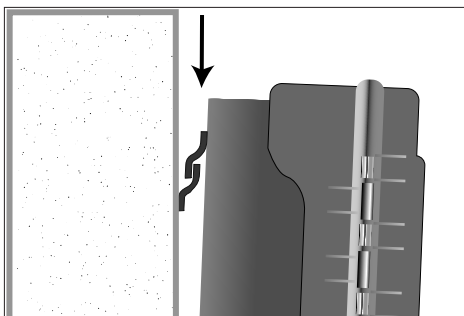
5. Secure the controller to the wall with the last screw through the tab at the bottom of the controller cabinet.
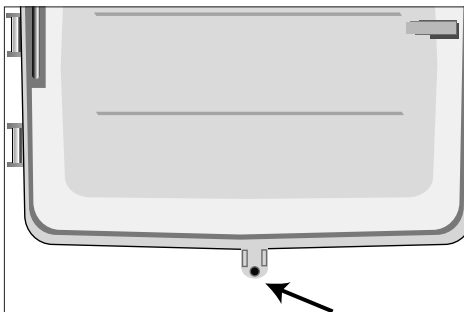
Wiring the Controller

There are three types of connections you must make to the controller:

- grounding connections
- connections to the field wires
- connections to the main power source

You may also want to connect your controller to switched or pulse sensors. The Rain Bird IM controller provides a separate 24 VAC connection for sensor power. For sensor connections, refer to the sensor manufacturer's instructions.

This section of the manual contains instructions for field valve, sensor, main power, and grounding connections.

Important: All wiring must be installed and connected in accordance with local codes.

Chapter 1: Installing the Controller, continued

Opening the Controller Cabinet

To perform the connections described in this section of the manual, you will need to open the controller cabinet and remove the coverplate to expose the inner wiring.

To do so:

1. Open the cabinet door.

   a. Unlock the door by inserting the key and turning the lock clockwise until the key is in a horizontal position.

   b. Press the tabs on the right side of the door to break the watertight seal.

   c. Open the door.
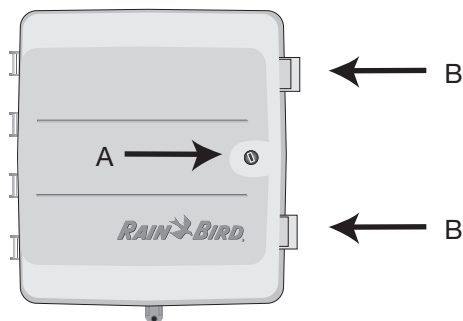
2. Swing the coverplate open by pulling on the plastic tab in the right center of the coverplate.
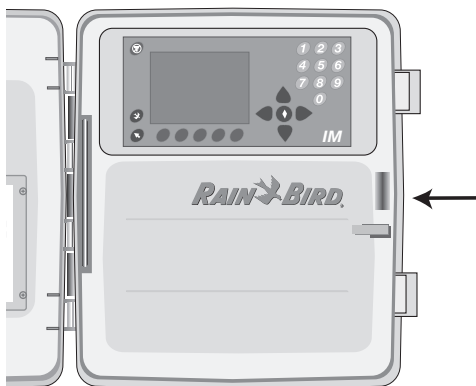
3. Remove the coverplate from its hinges by pushing down on the panel until the upper hinge comes down out of its hole. Slide the coverplate up and away to clear the lower hinge from its hole. Set the coverplate aside.

A

B
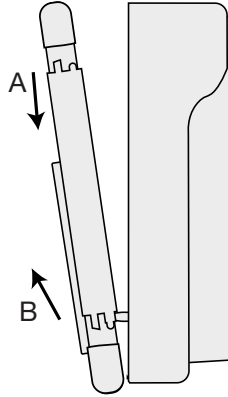
4. At the bottom of the cabinet, you will see the master valve and sensors terminals, the station valve terminals and the transformer/junction box assembly.

MV/Sensor
terminals

Station valve
terminals

Transformer/Junction
box assembly
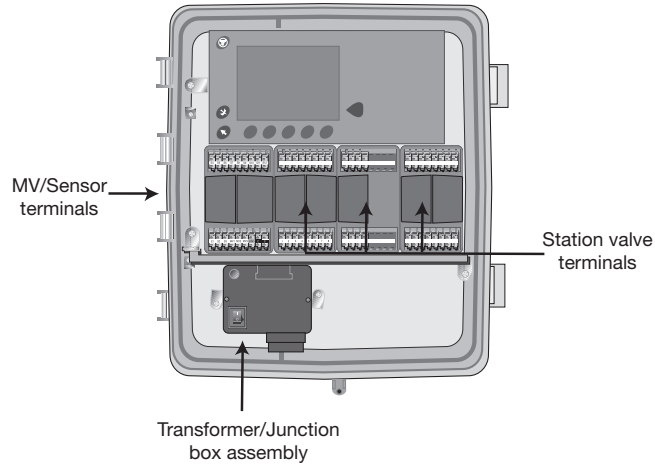
Chapter 1: Installing the Controller, continued

Connections to the Main Power Source

The main power connections are made on a terminal strip located inside the transformer assembly.

Important: Power connections should be made only by a qualified electrician. ⚡

Important: Default factory main power input voltage settings for domestic models is 115VAC/60Hz, and for international models is 230VAC/50Hz. If you need to use any other main power input voltage please contact Rain Bird Technical Services 1-800-247-3782 (U.S. only).

Important: The wires that connect the controller to the main power source must be installed in a conduit separate from the one that contains the field wires.

Important: Use a #10 (6 mm) or #8 (10 mm) wire to connect the controller to the ground rod. Use a standard copper clad, 5/8" (1.59 cm) diameter, 8' (243.84 cm) long ground rod.

To connect the power input wires from the main power source to the controller and connect the controller to a ground rod:

1. Remove the two screws on the top of the transformer assembly and lift the top enough to expose the green terminal strip. Be careful not to remove any of the wire connections to the switch located on the transformer top.
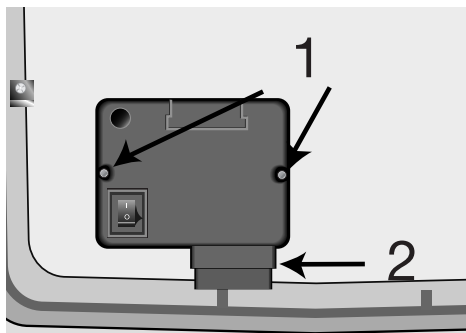
2. Remove the wire shroud.
3. Knock out one of the two holes on the bottom of the controller cabinet that were covered by the wire shroud.
4. Feed the wires from the main power source up through the selected conduit opening.

Chapter 1: Installing the Controller, continued

5. Connect the power source hot wire (often black for the 115 volt, 60 HZ installations and brown for the 230 volt, 50 HZ installations) to the right hand terminal marked with the letter "L."
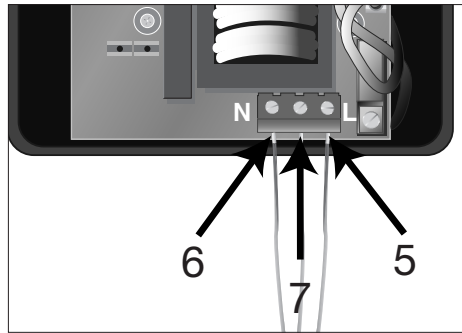
6. Connect the power source common wire (often white for the 115 volt, 60 HZ installations and blue for 230 volt, 50 HZ installations) to the left hand terminal marked with the letter "N."

7. Connect the power source ground wire (usually green for the 115 volt, 60 HZ installations and green and yellow for the 230 volt, 50 HZ installations) to the center terminal marked with the letter "G."

8. Feed the ground wire that is attached to a grounding rod up through the selected conduit opening at the bottom of the cabinet.

9. Loosen the screw on the copper earth ground terminal inside the junction box and place the ground wire into the terminal. Tighten the screw so that the ground wire is secure.
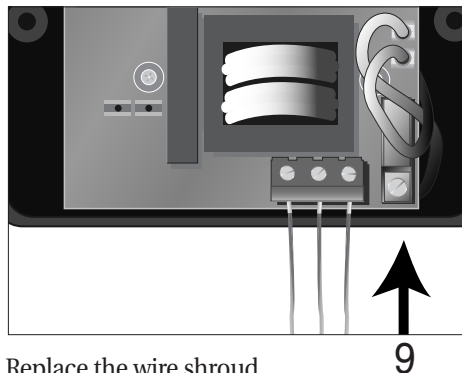
10. Replace the wire shroud.

11. Replace the top of the transformer assembly.

12. Replace the two Phillips screws in the top of the transformer assembly.

Chapter 1: Installing the Controller, continued

Connections to Valves

Each field valve that is controlled by the Rain Bird IM controller must be connected to a station terminal. Each station terminal is capable of operating a maximum of eight standard 7VA Rain Bird valves, but only when one station is operating. As the number of simultaneously running stations increases, the number of valves per station decreases. For example, when eight stations are running simultaneously, there can be only one valve per station.

Important: The wires you use to connect the controller to the field valves must be approved for underground use. See the Rain Bird catalog for exact wire specifications.

Important: DO NOT install the valve wires in the same conduit used for wires to the main power source.

To connect the valve wires:

1. Feed each valve wire up through the conduit opening on the bottom right side of the cabinet. Two 3" (7,6 cm) knockouts are provided at the bottom. Select the appropriate knockouts for your specific application to use for conduit openings.

2. Strip 1/2" (1.27 cm) from the end of the valve wire. Insert the wire into the appropriate station terminal. If the wire does not enter securely into the hole, press down on the orange lever as you insert the wire.
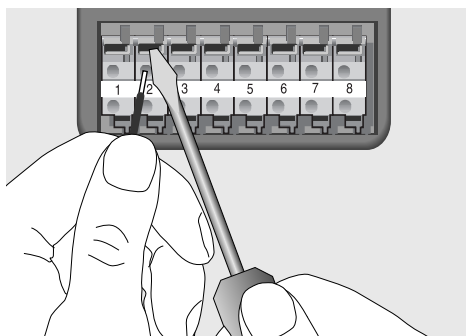
3. Repeat for all stations being used.

   Note: On some controllers there may be more field wire connectors available than there are installed stations because station connector kits are sold in units of 16, while stations are sold in units of 4.

4. Attach the valve common wire to one of the two common terminals in the same way.

5. If your system includes a master valve or a 24 volt pump start relay, connect the wire from that device to one of the three master valve (MV) terminals on the controller in the same manner as you connected the other wires.

Note: Master valves can be enabled or disabled for each individual station. For more information, see "Associating Master Valves" in Chapter 4.

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Connections to Optional Sensors

The Rain Bird IM controller allows you to connect up to 12 optional sensors. The IM controller will recognize two types of sensors: switched and pulse. Each type of sensor requires a unique module. One switched sensor module enabling the first three sensor inputs is supplied with the basic Rain Bird IM controller unit. To install an additional sensor module in the cabinet, see the instructions that accompany your sensor module.

Important: The wires you use to connect the controller to the sensor must be approved for underground use. See the Rain Bird catalog for exact wire specifications.

Important: The sensor wires should be installed in a conduit other than the one that contains wires to the main power source.

Note: There may be more sensor wire connectors available than there are installed sensor inputs because the controller is sold with connectors for 12 sensors, while sensor inputs are sold in units of 3.

To connect the sensor's wires to the controller:

1. Strip 1/2" (1.3 cm) from the end of the sensor wires. Insert one wire into each of the appropriate sensor terminals. If the sensor wire does not enter securely into the terminal hole, press down on the orange lever as you insert the wire.

2. Route the wires out of the controller through the selected conduit opening at the bottom of the cabinet.

3. Connect the other end of the wires to the sensor.

4. Follow the sensor manufacturer's directions for placing and connecting the sensor and for setting the shutoff level, if appropriate.

Note: See Chapter 3, Setting up the Controller and Chapter 4, Associating Stations and Sensors for directions on using sensors to affect the watering schedule.

Putting the Controller Back Together

Congratulations! You have completed the mounting and wiring of your new Rain Bird IM controller. To put the controller back together:

1. Replace the coverplate.
2. Close the cabinet door.
3. Turn on the main power to the controller.

Before beginning to program or operate your controller, take a moment to familiarize yourself with the controller's front panel and interface. The following pages contain a short description of the buttons and major screen groups. Specific instructions for all of the operations you can perform begin in Chapter 3, Setting Up the Controller.

The Controller's Front Panel
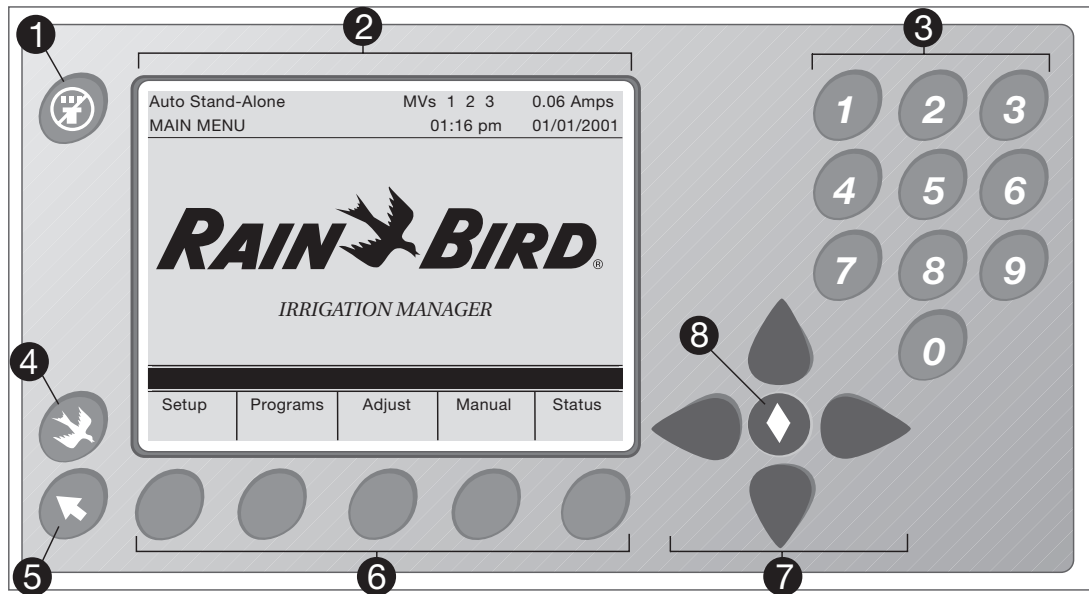
❶ Auto/Off button Press the button to select Auto to enable all programs; select Off to suspend all programs.

❷ Liquid Crystal Display (LCD) This screen displays the user interface of the Rain Bird IM controller.

❸ Numeric Keypad buttons Press these buttons to enter numbers.

❹ Main Menu button Press this button at any time to return to the Main Menu screen.

❺ Previous Screen button Press this button to go back one screen in the interface.

❻ Soft buttons Press to select interface menu options (the button functions change depending upon the screen displayed).

❼ Up, Down, Left, Right buttons Press these buttons to move the highlight up, down, left, or right on the LCD screen.

❽ Select button Press this button to select the highlighted item or scroll through possible settings for the highlighted item.

Warning! Switching from Auto to Off while a program is running will immediately shut off all the stations, disregarding the delay between stations. This could lead to water hammer.

Note: To shut down the controller using the delay between stations, use the Pause feature in the STATUS DETAILS screen.

The Controller's Interface

The Controller's user interface is displayed in the liquid crystal display (LCD). The LCD allows you to see the work you are performing when you set up, program, or perform other tasks with the controller.

Five Screen Groups

The controller's user interface uses 24 screens arranged into five groups that contain all of the features and functions of the controller. The diagram below will help you to understand the flow of the user interface screens. The rest of this manual is organized in the same logical fashion as the screen flow depicted here.

```
                              ┌─────────────┐
                              │  Main Menu  │
                              └─────────────┘
                                     │
   ┌──────────┬──────────────┬───────┴───────┬──────────────┬──────────┐
┌──────┐  ┌──────────┐  ┌────────┐     ┌────────┐     ┌────────┐
│Setup │  │Programs  │  │Adjust  │     │Manual  │     │Status  │
└──────┘  └──────────┘  └────────┘     └────────┘     └────────┘
   │           │             │              │              │
Station     Assign        ET Adjust       Tests        Status Details
Setup       Stations
   
Peripheral  Water Days                 Flows & Amps     Sensor Status
Setup                                  Test

Sensor      Water Calendar             Hardware Tests   Log
Setup

Sensor      Station Settings                            Water Flows
Details

Stations &  Start Times
Sensors
```
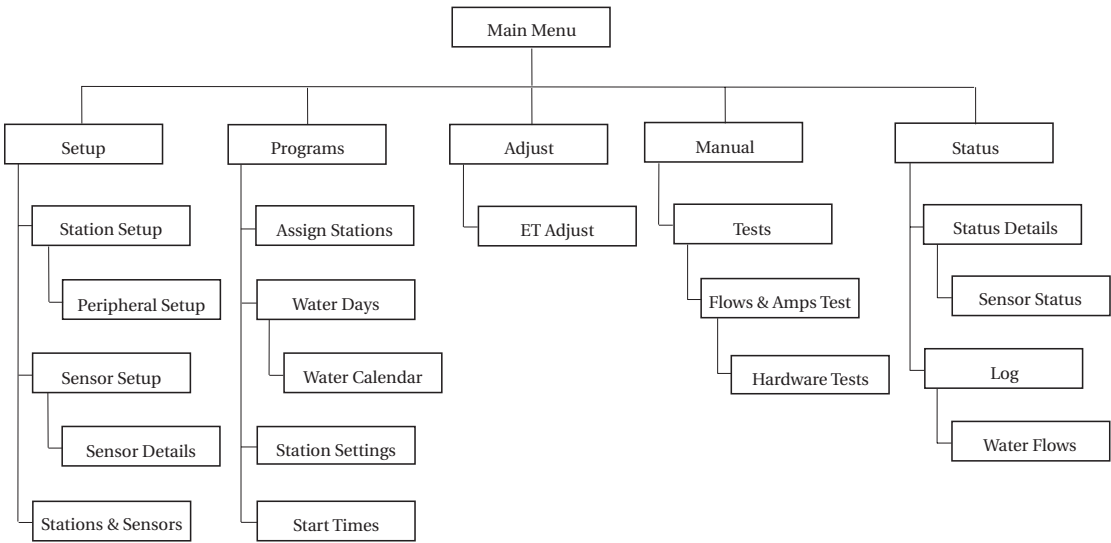
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Setup

From the SETUP screens, you set the basic values for the controller, such as time and units of measure plus station and sensor settings. You can also set values for advanced features such as flow limit, simultaneous stations, ET sources, logs, alarms, and passwords. These values should be set only during initial installation and after installing additional station and sensor modules.

Programs

From these screens, you create programs and assign stations, set water days, start times, and station settings. These screens are usually used infrequently.

Adjust

From these screens, you can adjust watering time by setting a water budget, rain delay, and evapotranspiration (ET) values. These screens are usually used periodically.

Manual

From these screens you perform all of the manual operations of the controller, such as running programs, test programs, and hardware diagnostics. These screens are usually used periodically.

Status

From these screens, you can check the status of the system and see schedules or logs. These screens are for viewing only; you cannot make any changes to programming from these screens. These screens are usually used frequently.

Additional Screens

In addition to the five screen groups, there are two other screens that may be displayed:

- **Alarm notification screen** — displays all alarm notifications. This screen disappears after the user presses any button.

- **Password screen** — appears when the user tries to enter data into a password protected field if more than five minutes have passed since the last password-protected entry. To enter a password, type your five-digit password in the Password field. When the fifth digit is entered, the controller accepts the whole password. You do not have to press the **Select** button.

Continuously Displayed Status Information

The following status information is displayed on all screens in the Rain Bird IM controller user interface:

```
 ②        ③
┌─────────────────────────────────────┐
① Off Stand-Alone      MVs 1 2 3   0.06 Amps
④ SETUP                     01:16 pm   01/01/2001    ⑤
      Contrast Setting (1-10)     5
   DATE AND TIME
      Date                 01/01/2001
      Time                 01:16 pm
      Daylight Savings     Yes
   SITE VALUES
      Stand Alone/Central Control   Stand-Alone
      Water Window Begins    12:00 am
      Water Window Ends      12:00 am
   UNITS
⑥ Toggle value with ♦ key
   ┌────────┬─────────┬─────────┬──────────┐
   │  Page  │ Station │ Sensor  │ Stations │
   │  Down  │  Setup  │  Setup  │& Sensors │
   └────────┴─────────┴─────────┴──────────┘
└─────────────────────────────────────┘
              ⑦
```
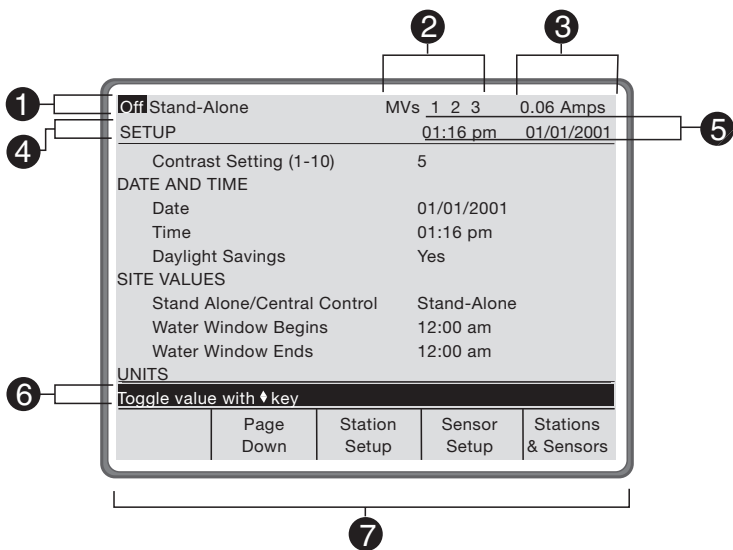
① **Operating Mode** Shows the current mode of the controller. Stand-Alone mode means that the controller is not under the control of a central computer. Central control means that the controller is under the control of a central computer. Possible modes include:

Auto Stand-Alone — automatic programs are in progress and under control of the controller.

Auto Central — automatic programs are in progress and under control of a central computer.

Manual Stand-Alone — both manual watering and automatic programs are in progress and under control of the controller.

Manual Central — locally controlled manual watering is in progress and automatic programs are under central control.

Note: A central control interface is not currently available for the IM controller. The controller should always be in stand-alone mode.

Test Stand-Alone — the Manual Flows and Amps test is running.

Pause Stand-Alone — all watering is suspended according to the Events Proceed Method setting in the SETUP screen. Automatic programs are under this controller's control.

Pause Central — all watering is suspended according to the Events Proceed Method setting in the SETUP screen. Automatic programs are under central control.

Rain Delay Stand-Alone — rain delay is in effect and all programs under local control that pay attention to rain delay are suspended.

Rain Delay Central — rain delay is in effect and all programs under central control that pay attention to rain delay are suspended.

Off — all controller activity is suspended.

Note: When the controller is paused, off, or in Rain Delay mode, the operating mode cell will alert you by flashing on and off.

❷ **Master Valve** — displays the master valves. Black numbers on a light ground indicate a closed valve; light numbers on a black ground indicate an open valve.

❸ **Amps** — displays the amps currently being drawn from the controller.

❹ **Screen Title** — displays the name of the current interface screen.

❺ **Current Time and Date** — displays the current time and date.

❻ **Hint Lines** — short phrases to aid you in navigating through the interface or entering data.

❼ **Soft Buttons** — notation for buttons that change function, depending upon the screen.

Chapter 3: Setting Up the Controller

This section of the manual explains how to set up the controller and the stations and sensors within the controller system.

Before you begin setup, it is a good idea to gather the information you will need about stations and sensors. For example:

• If you are using master valves, you must know which stations are associated with which master valves.

• If you want to track estimated water usage, you must know the estimated flow for each station.

• If you are programming by ET, you must know station precipitation rates.

• If you are using switched sensors, you must know whether the sensor is normally open or normally closed.

• If you are using pulse sensors, you must enter a calibration rate to count pulses.

You may not need to set up all the functions described in this chapter, but Rain Bird suggests that the first time you set up your controller you read through this entire chapter and set up controller functions in the order in which they appear. That way, you will be sure not to miss any important setup procedures. A Setup Worksheet has been provided in the Appendix.

Chapter 3: Setting Up the Controller, continued

To get to the SETUP screen from the MAIN MENU screen:

1. Press the **Setup** button.
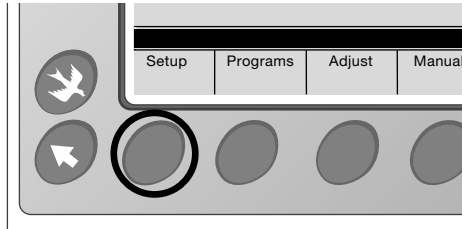
The SETUP screen is displayed.
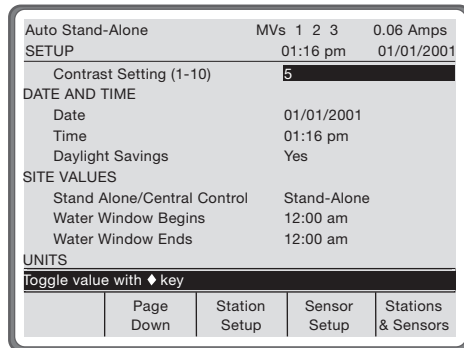
2. Complete the Setup procedures as described in this chapter.

3. When you are finished setting up the controller, stations, and sensors, press ⟲ to return to the MAIN MENU screen.

Note: Pressing any key will activate the display.

Note: You can press ⟲ at any time to return to the MAIN MENU screen; you can also press ↻ at any time to return to the previous screen.

Note: The **Page Up** and **Page Down** buttons on the SETUP screen allow you to navigate easily from page to page.

Chapter 3: Setting Up the Controller, continued

Setting the Screen Contrast

The controller's display has an adjustable contrast setting.

To change the contrast:

1. With the SETUP screen showing, use the arrow buttons to highlight **Contrast Setting (1–10)**, then press ◑ to scroll through the settings until the text on the screen is legible.

    Note: If you cannot read the screen at all, you can adjust the contrast by pressing ↺ , then the leftmost purple button, then ◑ every two seconds until the screen becomes visible.

Setting the Date and Time

In order to program the controller, you must first set the controller's internal clock and calendar.

To do so:

1. With the SETUP screen displayed, use the arrow buttons to highlight **Date**, then use the number buttons to enter today's date.

    Note: You must enter the date in the format MM/DD/YYYY.

2. Press ▼ to highlight **Time**, then use the number buttons to enter the current time.

    Note: You must enter the time in a 24-hour format, but it can be displayed in either a 12- or 24-hour format. The selection of display format for the time appears farther down on the SETUP screen. For more information, see Chapter 3, Setting Units of Measure and Formats.

3. Press ▼ to highlight **Daylight Savings**, then press ◑ to toggle between **Yes** and **No**. The **Yes** setting applies daylight savings to the controller's time keeping; the **No** setting does not. **No** is the default setting.

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Setting Site Values

The Site Values section of the SETUP screen allows you to set whether the controller is under the direction of a central computer. It also allows you to set a water window during which time watering is or is not permitted. For more information about setting the water window to be a permitted or not-permitted watering time, see Chapter 3, Setting Program Controls.

To do so:

1. With the SETUP screen displayed, use the arrow buttons to highlight **Stand-Alone/Central Control**. Then press ⊙ to toggle between **Stand-Alone** and **Central**. The **Stand-Alone** setting means that you may access all screens. The **Central Control** setting means that only the SETUP screen, the ADJUST watering screen, and the MANUAL screen are available for data entry. The central computer controls all other functions. The default setting is **Stand-Alone.**

    Note: A central control interface is not currently available for the IM controller. The controller should always be in stand-alone mode.

2. Press ▼ to highlight **Water Window Begins**. Then use the number buttons to enter the beginning time for the water window. The time must be entered in 24-hour format. (For example, 8:35 p.m. is entered as 2035.)

3. Press ▼ to highlight **Water Window Ends**. Then use the number buttons to enter the ending time for the water window. The time must be entered in 24-hour format.

    Note: If you do not want to restrict watering to a water window time, set the beginning time to 00:00 (12:00 a.m.) and the ending time to 00:00 (12:00 a.m.). These are the default settings.

Chapter 3: Setting Up the Controller, continued

Setting Units of Measure and Formats

The Units section of the SETUP screen allows you to set the units of measure and the type of format you prefer for various values.

To set preferred units of measure and formats:

1. Press ⬤ to highlight **Run Time**, then press ⬤ to toggle between the **MM:SS** (minutes:seconds) and **HH:MM** (hours: minutes) settings. The default setting is **HH:MM**.

2. Press ⬤ to highlight **Date Format**, then press ⬤ to cycle through the **MM/DD/YYYY** and **DD/MM/YYYY** settings. The default setting is **MM/DD/YYYY**.

3. Press ⬤ to highlight **Time-Of-Day Format**, then press ⬤ to toggle between the **am/pm** (12 hour) and **24-hour** (military time) settings. The default setting is **24-hour**.

4. Press ⬤ to highlight **Pressure**, then press ⬤ to toggle between the **psi** (pounds/square inch), **bars** and **pascal** settings. The default setting is **psi**.

5. Press ⬤ to highlight **Precipitation Rate**. Then press ⬤ to toggle between the **in/hr** (inches per hour) and **mm/hr** (millimeters per hour). The default setting is **in/hr**.

6. Press ⬤ to highlight **ET & Rainfall**, then press ⬤ to toggle between **in** (inches per day) and **mm** (millimeters per day). The default setting is **inches per day**.

7. Press ⬤ to highlight **Volume**, then press ⬤ to cycle through **gal(US)** (US gallons), **ft³** (cubic feet), **liters** (liters), **m³** (cubic meters), and **gal(Imp)** (Imperial gallons). The default setting is **gal(US)**.

8. Press ⬤ to highlight **Flow Rate**, then press ⬤ to cycle through **gpm(US)** (US gallons per minute), **lpm** (liters per minute), **m³/hr** (cubic meters per hour) and **gpm(IMP)** (Imperial gallons per minute). The default setting is **gpm(US)**.

9. Press ⬤ to highlight **Wind Speed**, then press ⬤ to toggle between **mph** (miles per hour) and **kph** (kilometers per hour). The default setting is **mph**.

10. Press ⬤ to highlight **Temperature**, then press ⬤ to toggle between °**F** (degrees Fahrenheit) and °**C** (degrees Celsius). The default setting is °**F**.

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Setting Program Controls

The Program Controls section of the SETUP screen allows you to set values that affect all programs.

To set program controls:

1. Press ▼ to highlight **Program Method**. Then press ◑ to toggle between the **Grouped** and **Independent** settings. The **Grouped** setting limits you to seven programs, but each program can contain any number of stations. The **Independent** setting creates one program for each station. The default setting is **Grouped**.

   Note: Because changing this setting will erase existing programs once the controller has been programmed, a message will appear at the bottom of the screen prompting you to press a button to Confirm or Cancel before switching between the Grouped and Independent settings.

2. Press ▼ to highlight **Manual Watering Allowed**, then press ◑ to cycle through the **Inside Window** (manual watering will only be permitted inside of the water window time specified), **Outside Window** (manual watering will only be permitted outside of the water window time specified) and **Anytime** (manual watering will be permitted at any time) settings. The default setting is **Inside Window**. For more information about setting a water window, see Chapter 3, Setting Site Values.

3. Press ▼ to highlight **Max Irrigation Stations**, then press ◑ to cycle from **1** through **8** or use the number buttons to enter the number of stations directly. The default setting is **1**.

   Note: The IM controller is designed to operate a maximum of 8 standard Rain Bird 7VA solenoid valves plus three master valves simultaneously. Set the Max Irrigation Stations such that the station with the largest number of valves attached will not overload the controller. For example, if Stations 15 and 16 have four standard Rain Bird valves attached to them, set the Max Irrigation Stations to 2.

4. Press ▼ to highlight **Max Water Flow Rate**. If you want to enter a value, use the number buttons to enter the value. If you want to set no limit, press **9** repeatedly until the field is full. Press **9** one more time to return to the default setting, **No Limit**. Values are in the Flow Rate unit of measure you specified. For more information about Flow Rate units, see Chapter 3, Setting Units of Measure and Formats. This value is used to determine which stations may overlap, based upon their estimated or measured water flows.

5. Press ▼ to highlight **Maximum Monthly Volume**. If you want to enter a value, press ◑, then use the number buttons to enter the value. If you want to set no limit, press **9** until the field is full. Press **9** one more time to return the setting to **No Limit**. Values are in the volume unit of measure you specified. For more information about volume units, see Chapter 3, Setting Units of Measure and Formats. When this setting is exceeded, an alarm is issued and watering is inhibited until the beginning of the next calendar month.

6. Press ▼ to highlight **Events Proceed Method**, then press ⊙ to toggle between **Program in Progress** and **Program Resume**. When watering is temporarily interrupted by pressing the Pause button or by a power failure, the **Program in Progress** setting allows the schedules to continue running without watering. The **Program Resume** setting resumes the schedule where it was stopped. The default setting is **Program in Progress**.

7. Press ▼ to highlight **Clear Calendar Omit Days**, then press ⊙ to toggle between the **As They Pass** and **Do Not Clear** settings. The default setting is **As They Pass**. This setting refers to the Water Calendar in which you can set non-watering days. **Do Not Clear** allows these non-watering days to remain on the calendar from year to year; **As They Pass** removes each non-watering day as soon as it passes. For more information about the water calendar, see Chapter 5, Setting Water Days.

Setting Valve Controls

The Valve Control section of the SETUP screen allows you to select the position of the master valves. If the valve is normally closed when not energized, select Closed. If the valve is normally open when not energized, select Open.

To set the master valves:

1. Press ▼ to highlight **MV1 Normal Position**. Then press ⊙ to toggle between **Open** and **Closed**. The default setting is **Closed**.

2. Repeat step 1 for **MV2 Normal Position** and **MV3 Normal Position**.

3. Press ▼ to highlight **MV1 Between Stations**, then press ⊙ to toggle between **Open** and **Closed**. The **MVI Between Stations** setting allows you to determine whether you would prefer to leave Master Valve 1 open or closed between operation of the stations. The default setting is **Closed**.

4. Repeat step 3 for **MV2 Between Stations** and **MV3 Between Stations**.

5. Press ▼ to highlight **Delay Between MVs**, then use the number buttons to enter the amount of time between master valves closing and opening. The default setting is **00:10 MM:SS**. This value can be set from **00:00 MM:SS** to **20:00 MM:SS**.

6. Press ▼ to highlight **Delay Between Stations**, then use the number buttons to enter the amount of time between stations closing and opening simultaneously. The default setting is **00:10 MM:SS**. This value can be set from **00:00 MM:SS** to **20:00 MM:SS**.

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Setting Alarms and Logs

The Alarms and Logs section of the SETUP screen allows you to set how the controller will respond to a given event or alarm. All alarms are automatically displayed on the ALARM screen.

To set event or alarm responses:

1. Press ◆ to highlight **Over Flow Alarm Response,** then press ◐ to cycle through the **Alarm** and **Alarm and Shutdown** settings. The default setting is **Alarm**. When you set the controller to shut down after an alarm, it stops the station until the beginning of the next controller day.

   Note: When the ALARM screen displays, you can remove it by pressing any button on the controller.

2. Repeat step 1 for **Low Flow Alarm Response**, **Over Current Alarm Response**, and **Low Current Alarm Response**.

3. Press ◆ to highlight **Log Alarms**, then press ◐ to toggle between **Yes** and **No**. **Yes** allows alarms to be kept on the controller logs available from the STATUS screen. No discards all alarms once the ALARM screen is cleared. The default setting is **Yes**.

4. Press ◆ to highlight **Log Access Events**, then press ◐ to toggle between **Yes** and **No**. **Yes** allows you to keep a log of access events, such as attempts to enter the password or gain access to protected controller settings. The default setting is **Yes**.

5. Press ◆ to highlight **Log Sensor Events**, then press ◐ to toggle between **Yes** and **No**. **Yes** allows you to keep a log of all sensor events, such as a sensor opening or closing or crossing a threshold, or a sensor's effect on a station's run time. The default setting is **Yes**.

6. Press ◆ to highlight **Log Water Events**, then press ◐ to toggle between **Yes** and **No**. **Yes** allows you to keep a log of all water events, such as all program starts and stops, all manual starts and stops, and master valve or station valve changes. The default setting is **Yes**.

   Note: For details on viewing the controller log, see Chapter 8, Viewing the Log.

Chapter 3: Setting Up the Controller, continued

Setting Alarm Tolerances

The Alarm Tolerance section of the SETUP screen allows you to set the system's tolerance levels for issuing alarms. These tolerance levels are expressed in percentages over or under the set limit. Current and flow limits are "learned" by the controller when you run a Flows and Amps Test. For more information, see Chapter 7, Running the Flows and Amps Test. You can set other sensor limits from the Sensor SETUP screen. For more information, see Chapter 4, Setting Up Sensors.

To set alarm tolerances:

1. Press ▼ to highlight **Percent Over Flow**, then use the number buttons to enter the percentage. The default setting is **20%**.

2. Repeat step 1 for **Percent Under Flow** and **Percent Under Current**. The default setting is **30%** for both.

   Note: The line Max. Output Current (Amps) 3.5 indicates that the maximum controller output is 3.5A. This value is not adjustable. Any time the controller detects more than 3.5 Amps, an alarm will occur.

3. Press ▼ to highlight **Flow Settling Time**, then use the number buttons to enter the amount of time that the above condition must exist before an alarm is issued. The default time is **30 seconds**.

Setting Password Protection

Passwords prevent unauthorized users from changing data, but allow all users to see all screens. The one exception to this is the WATER FLOWS screen, which cannot be viewed without a password. Password protection can be enabled or disabled from the SETUP screen. If it is disabled, the cursor moves automatically to the next section of the SETUP screen. If it is enabled, you can select three levels of password protection, each with a corresponding password.

To set password protection:

1. Press ▼ to highlight **Password Protection**, then press ⊙ to toggle between **Enabled** and **Disabled**. If you choose enabled, follow steps 2 through 4 below. The default setting is **Disabled**.

2. Press ▼ to highlight **All Screens**, then use the number buttons to enter the five-digit password that will give a user access to all screens. When the fifth digit is entered, the controller accepts the whole password. You do not have to press ⊙ . The controller will prompt you to enter the password again for confirmation. Re-enter the password. The controller will indicate that the password is accepted, or did not match and must be re-entered.

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3. Press ▼ to highlight **Adjust, Manual, Status**, then use the number buttons to enter the five-digit password that will give a user access only to ADJUST, MANUAL, and STATUS screens. When the fifth digit is entered, the controller accepts the whole password. You do not have to press ⦿. The controller will prompt you to enter the password again for confirmation. Re-enter the password. The controller will indicate that the password is accepted, or did not match and must be re-entered.

4. Press ▼ to highlight **Manual Status**, then use the number buttons to enter the five-digit password that will give a user access only to all MANUAL and STATUS screens. When the fifth digit is entered, the controller accepts the whole password. You do not have to press ⦿. The controller will prompt you to enter the password again for confirmation. Re-enter the password. The controller will indicate that the password is accepted, or did not match and must be re-entered.

Note: Once passwords are enabled, they can be changed only by someone with the All Screens password.

Note: If the Password Protection field is changed from Enabled to Disabled, all existing passwords are cleared from the system.

Note: After password protection has been set, if a user tries to enter information in a password-protected cell, the PASSWORD ENTRY screen appears, requesting a password. Password entry allows the user access to all screens associated with that password, but if no data is input for more than 5 minutes, password protection resumes.

Note: If fewer than five digits are entered in a password field, that password is cleared. If the All Screens password is cleared, password protection is disabled.

Setting Hand Watering Restrictions

Hand watering can occur whenever there is a hose bib, quick-coupling (QC) valve, or manually activated valve on the site. The hand watering settings in the SETUP screen allow you to exceed the total water flow for irrigation stations when you are hand watering. The value you enter in the Max Hand Watering Flow field applies to each master valve for which you enter **Yes** to associate the valve with hand watering.

To set hand watering restrictions:

1. Press ▼ to highlight **Max Hand Watering Flow**, then use the number buttons to enter the value. For example, if you expect a flow of 40 gpm when a QC valve on the site is in use, enter 40.

2. Press ▼ to highlight **Master Valve 1**, then press ⦿ to toggle between **Yes** and **No**. The default setting is **Yes**.

3. Repeat step 2 for **Master Valve 2** and **Master Valve 3**.

Chapter 3: Setting Up the Controller, continued

Setting Evapotranspiration (ET) Source and Limits

The ET section of the SETUP screen allows you to specify what Evapotranspiration (ET) data will be used when watering is based on ET. You select the source of the ET value, then you set the maximum and minimum amounts permitted.

To set ET values:

1. Press ● to highlight **ET Source**, then press ● to cycle through **Weather List**, **Entered Value**, or **ET Sensor**. The default setting is **Weather List**.

   • **Weather List** — this value is selected by you at the ET ADJUST screen from a list of typical ET values for a given climate with consideration given to current weather conditions. For more information, see Chapter 6, Adjusting Evapotranspiration.

   • **Entered Value** — this selection allows you to set the average daily ET for each month of the year. This value is set at the ET ADJUST screen. For more information, see Chapter 6, Adjusting Evapotranspiration.

   • **ET Sensor** — this value is automatically read from an ET sensor designated at the SENSOR SETUP screen. For more information, see Chapter 4, Setting Up Sensors.

2. Press ● to highlight **Max Cumulative ET**, then use the number buttons to enter the maximum allowable amount of water the controller will apply in one day when in ET mode. The default amount is **five inches** (or **127 mm**).

3. Press ● to highlight **Maximum Daily ET**, then use the number buttons to enter the maximum allowable ET value for one day. The default is **three inches** (or **12.70 mm**). This is the maximum value that can be reported by the ET sensor or entered at the ET ADJUST screen.

4. Press ● to highlight **Minimum Daily ET**, then use the number buttons to enter the minimum allowable ET value for one day. The default is **zero**. This is the minimum value that can be reported by the ET sensor or entered at the ET ADJUST screen.

   Note: An error or alarm is issued when ET goes above the maximum value set or below the minimum value set.

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Setting Information About the Controller

The About This Controller section of the SETUP screen allows you to configure the hardware you are using with your controller and to see the firmware version.

To set controller information:

1. Press ▼ to highlight **Installed Stations**, then press ◐ to cycle through choices from **12** to **48** in increments of four. The number of installed stations depends upon the number of station modules installed in your controller. Each station module enables 4 stations. The value entered in this field should be 4 x the number of station modules installed. The default setting is **12**.

2. Press ▼ to highlight **Installed Sensors 1-3**, then press ◐ to cycle through **Switched**, **Pulse**, and **None**. The default is **Switched** because each IM controller is equipped from the factory with a switched sensor module pre-installed.

3. Repeat step 2 for **Installed Sensors 4-6**, **Installed Sensors 7-9**, and **Installed Sensors 10-12**. The default for these fields is **None**.

Note: The Firmware Version field is for display only and cannot be edited. It shows the release date of the installed firmware.

Chapter 4: Setting Up Stations and Sensors

This section of the manual explains how to set up the stations and sensors within the Rain Bird IM controller.

Before you begin setup, it is a good idea to gather the information you will need about stations and sensors. For example:

- If you are using master valves, you must know which stations are associated with which master valves.
- If you want to track estimated water usage, you must know the estimated flow for each station.
- If you are programming by ET, you must know station precipitation rates.
- If you are using switched sensors, you must know whether each sensor is normally open or normally closed.
- If you are using pulse sensors, you must enter a calibration rate to count pulses.

You may not need to set up all the functions described in this chapter, but we suggest that the first time you set up your controller you read through this entire chapter and program controller functions in the order in which they appear. That way, you will be sure not to miss any important procedures.

Chapter 4: Setting Up Stations and Sensors, continued

Setting Up Stations

The STATION SETUP screen allows you to describe the characteristics of individual stations on your controller, as well as the ground they irrigate. This screen also shows water flows and electrical currents as determined by the Flows and Amps tests that you can run via the MANUAL screens. For more information about these tests, see Chapter 7, Running the Flows and Amps Test.

1. With the SETUP screen displayed, press the **Station Setup** button.

Auto Stand-Alone				MVs 1 2 3		0.06 Amps	
STATION SETUP					01:16 pm		01/01/2001
Stn	MVs 123	Cycle HH:MM	Soak HH:MM	Est	Precip in/hr	Measured gpm/(US)	Amps
1	1--	00:00	00:00	0.000	0.00	0.000	0.00
2	---	00:00	00:00	0.000	0.00	0.000	0.00
3	---	00:00	00:00	0.000	0.00	0.000	0.00
4	---	00:00	00:00	0.000	0.00	0.000	0.00
5	---	00:00	00:00	0.000	0.00	0.000	0.00
6	---	00:00	00:00	0.000	0.00	0.000	0.00
7	---	00:00	00:00	0.000	0.00	0.000	0.00
8	---	00:00	00:00	0.000	0.00	0.000	0.00
Disassociate MV with station							
		Page Down	Copy Row		Clear Row	Peripheral Setup	

The STATION SETUP screen is displayed. The screen is a table: down the left side are station numbers; across the top are characteristics such as associated master valves, cycle and soak times, etc.

2. Complete the station setup procedures as described in this section.

Note: The STATION SETUP screen provides you with a **Copy Row/Paste Row** button. Press the **Copy Row** button to copy the contents of the entire current row. The **Copy Row** button changes to a **Paste Row** button and the highlight moves down one row. Move the highlight to the row where you want to paste the information and press **Paste Row**.

Note: The STATION SETUP screen provides you with a **Clear Row** button. Press **Clear Row** to reset all of the values in the current row to their defaults.

Note: The **Page Up** and **Page Down** buttons on the STATION SETUP screen allow you to navigate easily from page to page.

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Chapter 4: Setting Up Stations and Sensors, continued

Associating Master Valves (Optional)

You can associate between zero and three master valves with each station in any combination you wish on the STATION SETUP screen.

To assign master valves to stations:

1. With the STATION SETUP screen displayed, use the arrow buttons to highlight the cell of the table that corresponds to the station number and master valve number you want.

2. Press ◉ to toggle between assigned and unassigned settings.

Setting Cycle + Soak™ Times (Optional)

The Cycle + Soak™ feature is designed to conserve water that might puddle in tight soils such as clay, or end up as runoff on slopes. Cycle + Soak™ lets you break up the total watering time of a station into shorter cycles. You set a maximum watering time length and then minimum soak time. For example, if you want to water a station for a total of 20 minutes, but runoff begins to occur after five minutes, you can set the station for five minute maximum cycles and a minimum soak of 25 minutes between cycles. While the station is in soak mode, the controller operates other stations in the program. You can set cycle and soak times for stations from the STATION SETUP screen.

Auto Stand-Alone				MVs 1 2 3		0.06 Amps	
STATION SETUP					01:16 pm	01/01/2001	
Stn	MVs 123	Cycle HH:MM	Soak HH:MM	Est gpm (US)	Precip in/hr	Measured gpm (US)	Amps
1	123	00:05	00:25	6.000	5.00	0.000	0.00
2	----	00:05	00:25	6.000	5.00	0.000	0.00
3	----	00:00	00:00	0.000	0.00	0.000	0.00
4	----	00:00	00:00	0.000	0.00	0.000	0.00
5	----	00:00	00:00	0.000	0.00	0.000	0.00
6	----	00:00	00:00	0.000	0.00	0.000	0.00
7	----	00:00	00:00	0.000	0.00	0.000	0.00
8	----	00:00	00:00	0.000	0.00	0.000	0.00
Associate MV with station							
		Page Down	Copy Row	Clear Row	Peripheral Setup		

To set cycle and soak times:

1. Use the arrow buttons to highlight the cell of the table that corresponds to the station number and the cycle time, then use the number buttons to set the maximum length of time to water. Times appear in the format specified on the SETUP screen.

2. Use the arrow buttons to highlight the cell of the table that corresponds to the station number and the soak time, then use the number buttons to set the minimum length of time to soak. Times appear in the format specified on the SETUP screen.

Setting Estimated Water Flow (Optional)

This cell in the STATION SETUP screen allows you to enter the estimated water flow for the station you are setting up. The estimate you enter here will be used for logging water use and for volumetric programming only if a Flows and Amps test is not run to allow the controller to learn actual flow rates. The estimated flow is displayed in the units specified on the SETUP screen.

To set estimated water flows:

1. Use the arrow buttons to highlight the cell of the table that corresponds to the station number and estimated flow.
2. Use the number buttons to enter the estimated flow.

Warning: The station may not operate if the station flow rate entered in the STATION SETUP screen exceeds the controller maximum flow rate entered in the SETUP screen.

Note: When entering numeric data, the controller will assign decimal points based on the number of digits you enter. In the estimated water flow field there are three decimal places, so at least three digits must be entered to include the decimal point. For example, enter 1-6 to display the value 16.000; press 1-6-0 to display the value 0.160.

Setting Precipitation Rates

This cell in the STATION SETUP screen allows you to enter the actual precipitation rate for the station. This value is required for programming by ET, but is not needed for other types of programming. The value is displayed in the units specified on the SETUP screen.

To set precipitation rates:

1. Use the arrow buttons to highlight the cell of the table that corresponds to the station number and precipitation rate.
2. Use the number buttons to enter the precipitation rate.

Viewing Measured Water Flow

This cell allows you to see the actual water flow for the station. This cell displays a value only after a flow sensor has been assigned to the station and a Flows test has been run. The value is displayed in the units specified on the SETUP screen. This field is not editable.

Viewing Measured Current Draw

This cell allows you to see the actual electrical current in amps drawn by the station when it is in operation. This cell displays a value only after an Amps test has been run. This field is not editable.

Setting Up Sensors

1. With the SETUP screen displayed, press the **Sensor Setup** button.

   The SENSOR SETUP screen is displayed. This screen allows you to set the characteristics of sensors you will be using with your controller. The screen is a table with sensor numbers on the left side of the table and characteristics at the top.

```
Auto Stand-Alone          MVs 1 2 3     0.06 Amps
SENSOR SETUP                01:16 pm   01/01/2001
                      Inhibits
Type     Use      When   Limit     Units
  1  S  Freeze   Closed
  2  S   Rain     Open
  3  S    –
  4  P    –                     –
  5  P    –
  6  P

Freeze sensor

                   Sensor     Clear
                   Details     Row
```

2. Complete the sensor setup procedures as described in this section.

Note: The SENSOR SETUP screen provides you with a **Clear Row** button. Press **Clear Row** to reset all of the values in the current row to their defaults.

Viewing Sensor Types

The type of sensor appears to the right of the sensor number. The sensor type is automatically assigned to the sensor number from information entered in the About This Controller section of the SETUP Screen. This cell is not editable.

- **S** = switch (two states: open or closed)
- **P** = pulse (discrete output with a certain number of pulses per unit of measure)

Defining Sensor Use

This cell enables the controller to determine which sensors are flow sensors, which sensor is the site ET sensor, and which sensors have other functions. The variety of choices for this cell help you to remember the sensor's purpose.

To set sensor use:

With the SENSOR SETUP screen displayed, use the arrow buttons to highlight the cell that corresponds to the sensor number and the **Use** characteristic, then press ◐ to cycle through the following choices:

Switch Sensor		Pulse Sensor	
Use characteristic	*Description*	*Use characteristic*	*Description*
Press	pressure (switch)	Rain	measured rainfall (pulse or switch)
Freeze	freeze (switch)		
Depth	depth (switch)	Generic	generic (pulse or switch)
Light	light (switch)	ET	evapotranspiration (pulse)
Moist	soil moisture (switch)	Flow MV1	water flow meter associated with Master Valve 1 (pulse)
Motion	motion (switch)	Flow MV2	water flow meter associated with Master Valve 2 (pulse)
Temp	temperature (switch)		
Rain	measured rainfall (pulse or switch)	Flow MV3	water flow meter associated with Master Valve 3 (pulse)
Generic	generic (pulse or switch)	Wind	wind speed (pulse)
—	not in use	Flow	flow meter not associated with master valves (pulse)
		—	not in use

Setting Inhibit Conditions

These cells allow you to set the conditions under which watering will be interrupted (until the condition is no longer true) or canceled (for the remainder of the program). The possible values for the **Inhibits When** and **Inhibits Limit** cells are determined by what is entered in the sensor **Use** cell to the left. The cells to the right of the **Limit** cells display the unit of measure selected at the SETUP screen.

To set inhibit conditions:

1. With the SENSOR SETUP screen displayed,
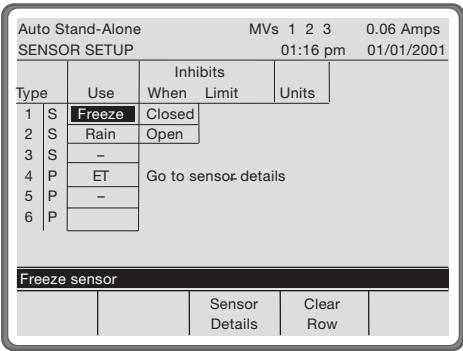
```
Auto Stand-Alone            MVs 1 2 3      0.06 Amps
SENSOR SETUP                   01:16 pm    01/01/2001
                         Inhibits
   Type      Use      When    Limit      Units
     1  S   Freeze   Closed
     2  S    Rain    Open
     3  S     –
     4  P     ET     Go to sensor details
     5  P     –
     6  P

   Freeze sensor
                       Sensor      Clear
                       Details     Row
```

use the arrow buttons to highlight the cell that corresponds to the sensor number and **Inhibits When** characteristic, then press ◐ to cycle through the following choices:

Switch Sensors

- **Open** (the default value) — The sensor stops watering when the sensor circuit is open.

- **Closed** — The sensor stops watering when the sensor circuit is closed.

Pulse Sensors

Note: To set inhibit conditions for pulse sensors, you must first enter information about the pulse sensors on the SENSOR DETAILS screen. For more information, see Chapter 4, Setting Calibration for Pulse Sensors.

- **Never** (the default value) — The controller will never stop watering because of the sensor.

- **<** (less than) — The sensor will stop watering when the value is less than the amount in the cell to the right.

- **>** (greater than) — The sensor will stop watering when the value is greater than the amount in the cell to the right.

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2. For pulse sensors only, use the arrow buttons to highlight the cell that corresponds to the sensor number and **Inhibits Limit** characteristic, then use the number buttons to enter the threshold at which watering is allowed or inhibited. The type of units (inches or millimeters, psi or bars, etc.) is defined in the SETUP screen. For more information on selecting the type of units, see Chapter 3, Setting Units of Measure and Formats.

Setting Calibration for Pulse Sensors

The Rain Bird IM controller recognizes two types of pulse sensors. The first type is sensors that record rates, such as flow meters and anemometers. These sensors can be used to record both a rate, such as flow, and the cumulative amount, such as volume of water through a pipe. The second type of pulse sensor is the pure accumulator. This type includes the ET sensor and rain bucket. In order for the IM controller to properly translate the signals being received from a pulse sensor, two calibration factors must be entered into the SENSOR DETAILS screen.

To set the calibration for pulse sensors:

1. Determine the calibration factors for the type of pulse sensors you are using.

    • *If you are calibrating rate sensors,*

      Calibration of flow meters is entered into the IM controller in the form:

      Output Value= K * (f + Φ)

      K = calibration factor, or "K factor," in unit of measurement per Hz

      f = frequency, in Hz (measured)

      Φ = offset, in Hz

      Hz are in pulses per second

      For example, a flow sensor with an output of 200 pulses per gallon has a K factor of:

      $$K = \frac{1 \text{ gallon}}{200 \text{ pulses}} * \frac{60 \text{ seconds}}{1 \text{ minute}} = 0.30 \frac{\text{gallons/minute (GPM)}}{\text{pulses/second (Hz)}}$$

      The controller interface for flow meters has been designed to accept the "K factor" and offset as defined for Data Industrial flow meters.

      Other manufacturers, such as Fluidyne, may provide K factors that are defined differently, and need to be converted to fit the equation defined for Data Industrial flow meters. Some sensors will not have both a "K factor" and an offset defined. For example, the Fluidyne flow meters have no offset (i.e., offset = 0).

- *If you are calibrating accumulating sensors,*

   For accumulating sensors, the calibration equation is cast in terms of pulses rather than frequency.

   The calibration of accumulating sensors is entered into the IM controller in the form:

   Output value = K* (f + Φ)

   K = calibration factor, or "K factor," in Unit of Measurement per pulse

   f = number of pulses (measured)

   Φ = offset, also in number of pulses (most likely Φ = 0)

2. Press the **Sensor Details** button from the SENSOR SETUP screen.

```
Auto Stand-Alone          MVs 1 2 3      0.06 Amps
SENSOR DETAILS                01:16 pm    01/01/2001

Type   Use      K              Offset     Units
 4  P   ET    0.00000     –   0.00000       in
 5  P    –
 6  P
                          –


value = (K * FREQUENCY) <+/-> (K * Offset)
          Page      Sensor     Clear     Peripheral
          Down      Details     Row        Setup
```
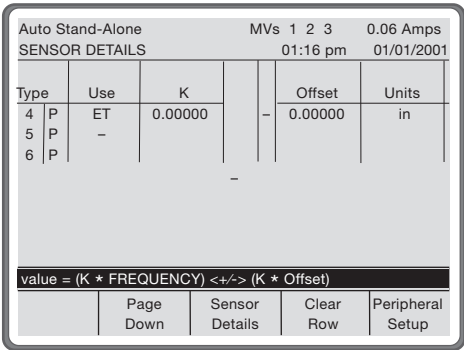
   The SENSOR DETAILS screen is displayed.

   Note: Only pulse sensors are displayed on this screen.

3. Use the arrow buttons to highlight the Calibration cell for the coefficient (K). Enter the value calculated in step 1.

4. Move the cursor to the right by pressing ▶ to highlight the untitled column between K and Offset. This column defines whether the offset is negative (**–**) or positive (**+**).

5. Press ◍ to toggle between **+** and **–** .

6. Move the cursor to the right by pressing ▶ to highlight the Offset column.

7. Enter the appropriate value using the number keys.

8. If necessary, return to the SENSOR SETUP screen to set inhibit conditions. See Chapter 4, Setting Inhibit Conditions.

Note: The IM controller accepts a maximum pulse sensor frequency of 250 Hz.

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Note: Sensor calibration information must be provided by the sensor manufacturer. This data is often presented as the number of pulses per unit of measure, or in the form of a coefficient and offset value. For example, for an ET gauge where one pulse = 0.01 inches of ET, enter the value of 0.01 for K and 0 for the Offset.

Associating Stations and Sensors

On the STATIONS AND SENSORS screen, you associate stations with sensors and indicate whether a sensor interrupts a station or cancels it until the end of the day.

To associate stations and sensors:

1. From the SETUP screen, press the **Stations & Sensors** button.

The STATIONS AND SENSORS screen is displayed. This screen allows you to set how the controller will react when conditions exceed sensor limits. The screen is a table with station numbers on the left side of the table and sensor numbers at the top. Only actual stations and defined sensors appear on this screen.

Note: The STATIONS AND SENSORS screen provides you with a **Copy Row/Paste Row** button. Press the **Copy Row** button to copy the contents of the entire current row. The **Copy Row** button changes to a **Paste Row** button and the highlight moves down one row. Move the highlight to the row where you want to paste the information and press **Paste Row**.

Note: The STATIONS AND SENSORS screen provides you with a **Clear** button. Press **Clear** to reset all of the values in the current row to their defaults.

Note: When a sensor is defined as Flow MV1, Flow MV2 or Flow MV3, the sensor has been previously associated with a master valve and all of the stations associated with that master valve. This cannot be changed in the STATIONS AND SENSORS screen.

2. Use the arrow buttons to highlight the cell that corresponds to the station number and sensor number, then press ⊙ to cycle through **Cancel, Interrupt,** and **blank** settings.

    *   **Cancel (Can)** — The remainder of the station's watering time in the program is canceled for the present day and the program advances immediately to the next watering activity.

    *   **Interrupt (Int)** — The station's valves close while the sensor is beyond its limit. If the sensor's state changes during the current controller day, the program at the station resumes where it left off. If the sensor state does not change during the controller day, the station is canceled at the end of that day.

    *   **Blank (–)** — The sensor has no effect on the station.

Chapter 5: Programming the Controller

The PROGRAMS screen allows you to create up to seven programs. It also allows you to schedule hand watering and provides access to station assignments, and start times, as well as the STATION SETTINGS, WATER DAYS, and WATER CALENDAR screens.

Before you begin programming, it is a good idea to chart your watering schedule on a piece of paper, taking into account each station and how often you want to repeat each schedule. A blank schedule is provided for you at the end of this manual.

If you enter programs that conflict with each other, the Rain Bird IM controller resolves the conflict by using this predefined priority sequence:

- **Manually run programs or stations have top priority.**
- **Non-irrigation programs run before drip programs.**
- **Drip programs run before irrigation programs.**
- **Programs run in ascending order (A before B).**
- **Stations run in ascending order (1 before 2).**

Chapter 5: Programming the Controller, continued

You can program the Rain Bird IM controller program features in any order. We suggest, however, that you setup one program at a time and complete all screens for the program on which you are working before moving on to another program.

To get to the PROGRAMS screen from the MAIN MENU screen:

1. Press the **Programs** button.

Auto Stand-Alone				MVs 1 2 3		0.06 Amps
PROGRAMS AND SENSORS				01:16 pm		01/01/2001
Prog	Type	By	Water Window	Water Days	Start Times	Rain Delay
A	Irr	ET	Yes	14-Day	Std	Yes
B	Non	Time	No	14-Day	Std	No
C	Irr	Time	Yes	14-Day	Std	Yes
D	Non	Time	No	14-Day	Std	No
E	Off					
F	Off					
G	Off					
Hand				14-Day		
Irrigation program						
	Assign Stations		Water Days	Station Settings		Start Times

The PROGRAMS screen is displayed. The first programming screen is a table with programs listed on the left side and program characteristics across the top.

2. Complete the programming procedures as described in this chapter.

3. When you are finished defining programs, press ↵ to return to the MAIN MENU screen.

Note: Pressing any key will activate the display.

Note: You can press ↵ at any time to return to the MAIN MENU screen; you can also press ↩ at any time to return to the previous screen.

Note: The **Page Up** and **Page Down** buttons on some portions of the PROGRAMS screen and related screens allow you to navigate easily from page to page.

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Selecting the Program Type

The program type dictates what the program's constraints are:

- **Off** — The program will not execute.
- **Irrigation (Irr)** — The program is affected by **Auto/Off**, **Pause**, **Maximum Stations** and **Delay Between Stations** settings. **Water Window, Rain Delay** and **Water Budget** settings are available.
- **Drip** — The program is affected by **Auto/Off** and **Pause** and will always run simultaneously with other programs. **Water Window, Rain Delay** and **Water Budget** settings are available.
- **Non-irrigation (Non)** — You cannot disable the program with **Pause**. The **Rain Delay** is available.

To select a program type:

1. With the PROGRAMS screen displayed, use the arrow buttons to highlight the **Type** cell for the program you want.

2. Press ◐ to cycle through **Off**, **Irrigation** (Irr), **Drip,** and **Non-irrigation** (Non)settings. The default setting is **Off**.

Note: There is also one hand watering program, listed after the seven grouped programs. This watering program allows you to schedule hand watering on certain stations on certain days.

Warning: Once a program has been created, if you change the program type you may lose information about the program.

Selecting to Program by Run Time, ET, or Volume

For irrigation and drip programs, you can select to program by run time, ET, or volume. Non-irrigation or Hand programs must be programmed by run time. The default setting for all programs is run time.

To select programming by run time, volume, or ET:

1. With the PROGRAMS screen displayed, use the arrow buttons to highlight the By cell for the program you want.

2. Press ◐ to cycle through **Time, Volume** (Vol) and **ET** settings.

Note: For more information, see "Setting Station Adjustment Factors."

Note: To program by volume, you must have an estimated or actual flow rate assigned to each station in the STATION SETUP screen. To program by ET, you must have a precipitation rate assigned to each station on the STATION SETUP screen.

Warning: Once a program has been created, if you change the program selection you may lose information about the program.

Note: The IM controller has been designed to operate eight 7VA solenoids and three master valves at one time. Therefore, if operating drip and non-irrigation programs, it is recommended that a Flows and Amps test be run when programming the controller. This will help avoid overloading the controller outputs.

Chapter 5: Programming the Controller, continued

Using or Not Using the Water Window

For irrigation, drip, and hand watering programs, you can select whether to obey the controller's water window. The default setting for irrigation and drip programs is **Yes**; the default for non-irrigation and hand watering programs is **No**.

To set water window usage:

1. With the PROGRAMS screen displayed, use the arrow buttons to highlight the **Water Window** cell for the program you want.

2. Press ◑ to toggle between **Yes** and **No**.

Note: For more information about the controller's water window, see Chapter 3, Setting Site Values.

Setting the Program's Schedule Pattern

You can choose from **14-day, Odd/Even,** or **Cyclical** scheduling for each program. The default setting is 14-day.

To do so:

1. With the PROGRAMS screen displayed, use the arrow buttons to highlight the **Water Days** cell for the program you want.

2. Press ◑ to cycle through **14-day, Odd/Even,** and **Cyclical** settings.

Note: For more information, see Chapter 5, Setting Water Days.

Selecting Standard or Looping Start Times

You can set either standard or looping start times for each program. The standard setting allows up to eight start times for each program; the loop setting allows one start time for stations in the program to run in a "loop." The default setting is standard.

To set standard or looping start times:

1. With the PROGRAMS screen displayed, use the arrow buttons to highlight the **Start Times** cell for the program you want.

2. Press ◑ to toggle between Standard (Std) and Loop settings.

Note: For more information, see Chapter 5, Setting Start Times.

Warning: Once a program has been created, if you change the program selection you may lose information about the program.

Using or Not Using Rain Delay

You can set whether each program will obey the controller's rain delay. The default setting for irrigation and drip programs is **Yes**; the default setting for non-irrigation and hand watering programs is **No**.

To set use of the controller's rain delay:

1. With the PROGRAMS screen displayed, use the arrow buttons to highlight the **Rain Delay** cell for the program you want.

2. Press ◑ to toggle between **Yes** and **No**.

Note: For more information, see Chapter 6, Starting Rain Delay.

Assigning Stations to Programs (for Grouped Programs Only)

If you set program controls to **Grouped** rather than **Independent** (see Chapter 3, Setting Program Controls) then you must assign stations to programs.

To do so:

1. With the PROGRAMS screen displayed, press the Assign Stations button

The ASSIGN STATIONS screen is displayed, which is a table with station numbers on the left and program letters across the top.

2. Use the arrow buttons to highlight the cell that corresponds to the program and station you want to associate with each other, then press ◑ to toggle between assigned (a sprinkler icon ⓣ) and unassigned (–). The default setting for all cells is unassigned (–).

Note: The ASSIGN STATIONS screen provides you with a **Copy Column/ Paste Column** button. Press the **Copy Column** button to copy the contents of the entire current column. The **Copy Column** button changes to a **Paste Column** button and the highlight moves one column to the right. Move the highlight to the column where you want to paste the information and press the **Paste Column** button.

Note: The ASSIGN STATIONS screen provides you with a **Clear Column** button. Press **Clear Column** to reset all of the values in the current column to their defaults.

Note: The ASSIGN STATIONS screen provides you with an **Assign All Stations** button. Press **Assign All Stations** to associate all installed stations with the selected program.

Setting Water Days

Once you have selected the program's schedule pattern (14-day, odd/even or cyclical), as described in Chapter 5, Selecting the Program's Schedule Pattern, you must set the water days within that pattern. The way in which you set the water days depends upon the type of schedule pattern you chose.

To set the water days:

1. With the PROGRAMS screen displayed, highlight any cell in the program row for which you want to set water days.

2. Press the **Water Days** button.

   The WATER DAYS screen is displayed.

3. Follow the directions below for the type of schedule pattern you chose for the highlighted program.

If You Selected 14-Day

The 14-Day WATER DAYS screen allows you to set individual days within the 14-day pattern. In addition, it identifies for you whether the current week is week 1 or week 2. Because the default setting is a cell with a sprinkler icon, or "watering," you should only change the days you **do not** wish to water.

To set the days within the 14-day schedule:

1. With the PROGRAMS screen displayed, highlight the desired program where Water Days are set to 14-day. Press the **Water Days** button to display the 14-day WATER DAYS screen.

2. With the 14-Day WATER DAYS screen displayed, use the arrow buttons to highlight the cell corresponding to the day and the week you would like to set.

```
Auto Stand-Alone            MVs  1  2  3      0.06 Amps
WATER DAYS - PROGRAM A         01:16 pm     01/01/2001


  14-DAY CALENDAR
  It is presently Week 1
           Sun  Mon  Tues  Wed  Thu   Fri   Sat
  Week 1

  Week 2


  Water on this day

                               Clear      Water
                               Row        Calendar
```
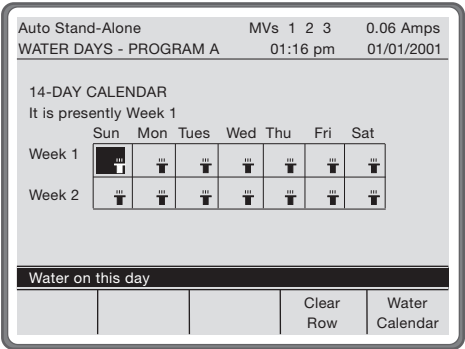
3. Press ⦿ to toggle between watering (🖈) and no watering (blank cell). Watering (🖈) is the default.

Note: If you want to keep the schedule you have set, but cancel watering on particular calendar days or day of the week, see Chapter 5, Canceling Watering on Particular Calendar Days.

Note: The WATER DAYS screen provides you with a **Clear Row** button. Press **Clear Row** to eliminate operation of that program for the selected week.

If You Selected Odd/Even

The Odd/Even WATER DAYS screen allows you to set watering on either even or odd days. You can also allow or omit watering on the last day of the month. The default settings are **Odd Days** and **Omit** last day.

To set odd or even days:

1. With the PROGRAMS screen displayed, highlight the desired program where Water Days are set to Odd/Even. Press the **Water Days** button to display the Odd/Even WATER DAYS screen.

2. With the Odd/Even WATER DAYS screen displayed, use the arrow buttons to highlight the **Water On** field, then press ◐ to toggle between **Odd Days** and **Even Days** settings.

```
Auto Stand-Alone          MVs  1  2  3      0.06 Amps
WATER DAYS - PROGRAM A        01:16 pm      01/01/2001

ODD/EVEN START DAYS

Water on              │ Odd Days │
Odd/Even last day     │ Omit     │



Water on odd days only
                                              Water
                                              Calendar
```
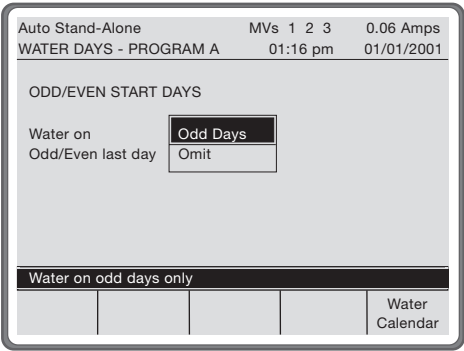
3. Press ▼ to highlight the **Odd/Even Last Day** field, then press ◐ to toggle between **Allow** and **Omit** settings.

4. Press the Water Calendar button to confirm that watering will be allowed on the proper days.

Note: For odd or even programs, the non-irrigation days are treated as Omit watering days. This means that no watering is allowed under any circumstances. These days have a gray ⊘ on the WATER CALENDAR screen. See Chapter 5, Canceling Watering on Particular Calendar Days for more information.

Note: If you want to keep the schedule you have set, but cancel watering on particular calendar days or days of the week, see Chapter 5, Canceling Watering on Particular Calendar Days.

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If You Selected Cyclical

The Cyclical WATER DAYS screen allows you to set a watering cycle that spans between **0** and **31** days. It also allows you to start anywhere in the cycle you choose. The default setting is **1** day.

To set the cycle:

1. With the PROGRAMS screen displayed, highlight the desired program where Water Days are set to Cyclical. Press the **Water Days** button to display the Cyclical WATER DAYS screen.

2. With the Cyclical WATER DAYS screen displayed, use the arrow buttons to highlight the **Water Every** field, then use the number buttons to enter a number from 0 to 31.

```
Auto Stand-Alone              MVs  1  2  3        0.06 Amps
WATER DAYS - PROGRAM A          01:16 pm        01/01/2001


CYCLICAL

   Water Every        1  Days

   Schedule again in  1  Days

   Enter 0 to Water Today


Enter the number of days (1-31)

                                                   Water
                                                   Calendar
```

3. Press ▼ to highlight the **Schedule Again In** field, then use the number buttons to enter a number from **0** to **31**. This is the number of days before the first watering day in the cycle.

    Note: Zero means "start today."

4. Press the **Water Calendar** button to confirm that watering will be allowed on the proper days.

Note: If you want to keep the schedule you have set, but cancel watering on particular calendar days or days of the week, see Chapter 5, Canceling Watering on Particular Calendar Days.

Canceling Watering on Particular Calendar Days

The WATER CALENDAR screen allows you to omit or allow watering on particular calendar days and on particular days of the week. Allowing watering does not mean that watering will occur, only that it is permitted if the program's schedule dictates it. Omitting watering means that <u>NO</u> watering will occur, including completion of unfinished programs from the previous day. The default setting is to allow watering for 14-day and cyclical programs. Odd/Even programs define all non-irrigation days as Omit watering days.

To set particular days to omit watering:

1. With any one of the WATER DAYS screens (14-Day, Odd/Even, or Cyclical) displayed, press the **Water Calendar** button.

   The WATER CALENDAR screen is displayed for the selected program. The WATER CALENDAR screen shows the current week and three additional weeks. It also shows the watering days you have programmed.

```
Auto Stand-Alone              MVs 1 2 3  0.06 Amps
WATER CALENDAR - PROGRAM A    01:16 pm   01/01/2001

2001    Sun  Mon  Tue  Wed  Thu  Fri  Sat
May      6    7    8    9    10   11   12
             T         T
May      13   14   15   16   17   18   19
                                  T
May      20   21   22   23   24   25   26
                    T
May      27   28   29   30   31   1    2
              T                   T

Press ♦ to omit watering on the highlighted day
 Page    Page    Omit     Copy     Clear
  Up     Down   Mondays  Calendar   All
```
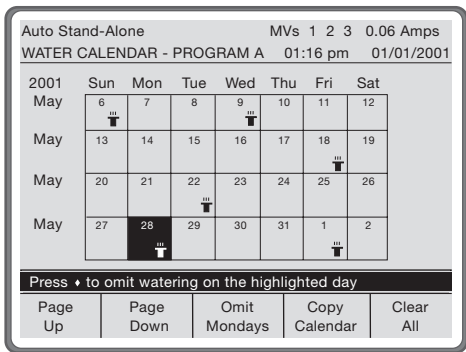
2. Use the arrow buttons to highlight the day of the month you want to change, then press ⬤ to toggle between allowing watering and omitting watering. Omit watering days have a ⊘.

Note: For odd or even programs, the non-irrigation days are treated as Omit watering days. This means that no watering is allowed under any circumstances. These days have a gray ⊘ on the WATER CALENDAR screen. An Omit watering day with a gray ⊘ cannot be changed to a watering day.

3. The WATER CALENDAR screen provides you with an **Omit (Day of the Week)**/**Allow (Day of the Week)** button so that you can omit or allow watering by days of the week. Highlight a cell in the column you want to change and press the **Omit (Day of the Week)** button. This button toggles to **Allow (Day of the Week)**.

Note: If you have selected to program on a cyclical schedule and a watering day is omitted, the watering will take place on the next available day.

Note: The WATER CALENDAR screen provides you with a **Clear All** button so that you can quickly reset all of the days to watering days. If you select **Clear All**, you will be asked if you want to clear all entries; select **Confirm** again to verify or select **Cancel** to cancel.

Note: Each program (A-G) has its own calendar. You can copy a calendar from one program to another by pressing the **Copy Calendar** button on the WATER CALENDAR screen. After pressing **Copy Calendar**, you will be asked to use the ◐ key to select the program to which you will copy the calendar. Repeat this sequence for each program you wish to copy.

Station Settings (Time, Volume, or ET)

Station settings factors are the run times, water volumes, or percentage of reference ET for each station within the program. Once you have selected the **Program By** setting (run time, ET, or volume) for the program, as described in Chapter 5, Selecting to Program by Run Time, ET, or Volume, you must set the station settings.

To enter station settings:

1. With the PROGRAMS screen displayed, highlight the program row for the station settings you want to enter.
2. Press the **Station Settings** button.

    The STATION SETTINGS screen is displayed. Only the stations that have been assigned to this program are displayed.
3. Follow the directions below for the type of schedule you have selected.

Chapter 5: Programming the Controller, continued

If You Selected Program by Time

The Run Time STATION SETTINGS screen allows you to set a run time for each station associated with the program. The default time is **00:00**.

To set run times:

1. With the Run Time STATION SETTINGS screen displayed, use the arrow buttons to highlight the **Run Time** for the stations you want.

```
┌─────────────────────────────────────────────┐
│ Auto Stand-Alone          MVs  1  2  3    0.06 Amps │
│ STATION SETTINGS - PROGRAM A   01:16 pm      01/01/2001 │
│       Run Time                               │
│ Stn   HH:MM                                  │
│  1    ▐00:00▌                                │
│  2    00:00                                  │
│  3    00:00                                  │
│  4    00:00                                  │
│  5    00:00                                  │
│  6    00:00                                  │
│  7    00:00                                  │
│  8    00:00                                  │
│ Run time (HH:MM) of each station            │
│         Page      Copy     Clear    Copy Top │
│         Down                        To All   │
└─────────────────────────────────────────────┘
```

2. Use the number buttons to enter the run times.

Note: The Run Time STATION SETTINGS screen provides you with a **Copy/Paste** button. Press the **Copy** button to copy the current row; the highlight moves to the next row. Highlight the row where you want to paste the information and press the **Paste** button.

Note: The Run Time STATION SETTINGS screen provides you with a **Copy Top to All** button. Press **Copy Top to All** to copy the value from the first station assigned to the program to all stations assigned.

Note: The Run Time STATION SETTINGS screen provides you with a **Clear** button. Press the **Clear** button to return the current row to its default setting (**00:00**).

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Chapter 5: Programming the Controller, continued

If You Selected Program by Volume

The Volume STATION SETTINGS screen allows you to set a volume for each station associated with the program. The default volume is **zero**. The units of measure for volume are determined in the SETUP screen. For more information on setting the volume units of measure, see Chapter 3, Setting Units of Measure and Formats.

To set the volume:

1. With the Volume STATION SETTINGS screen displayed, use the arrow buttons to highlight the volume for the station you want.

```
Auto Stand-Alone                    MVs  1  2  3   0.06 Amps
STATION SETTINGS - PROGRAM A           01:16 pm   01/01/2001
        Volume   Flow Rate   Water   Run Time
Stn     gal(US)  gpm(US)     Budget   HH:MM
1       0.0        0.555     100%    00:00
2       0.0        0.00      100%    00:00
3       0.0        0.00      100%    00:00
4       0.0        0.00      100%    00:00
5       0.0        0.00      100%    00:00
6       0.0        0.00      100%    00:00
7       0.0        0.00      100%    00:00
8       0.0        0.00      100%    00:00
Enter volume using numeric keypad
        Page       Copy      Clear   Copy Top
        Down                          To All
```

2. Use the number buttons to enter the volume.

Note: The Volume STATION SETTINGS screen provides you with a **Copy/Paste** button. Press the **Copy** button to copy the current row; the highlight moves to the next row. Highlight the row where you want to paste the information and press the **Paste** button.

Note: The Volume STATION SETTINGS screen provides you with a **Clear** button. Press the **Clear** button to return the current row to its default setting (**0.0**).

Note: If the controller's **Run Time** setting on the SETUP SCREEN is set to **HH:MM**, you must enter a volume that is large enough to require a run time of at least one minute or the station will not run. For run times under one minute, you must change the **Run Time** setting to **MM:SS**. See Chapter 3, Setting Units of Measure and Formats.

Note: There must be either an estimated flow entered on the STATION SETUP screen or a learned flow (see Chapter 7, Running the Flows and Amps Test) to generate a schedule for a volumetric program.

Note: The Volume STATION SETTINGS screen provides you with a **Copy Top to All** button. Press **Copy Top to All** to copy the value from the first station assigned to the program to all stations assigned.

If You Selected Program by ET

The ET STATION SETTINGS screen allows you to enter an ET adjustment factor for each station associated with the program. This is useful for adjusting the ET where stations are exposed to either more or less sunshine than the reference ET, or the crop coefficient of the plant material at that station differs from the reference ET. The default adjustment factor is 100%.

To set the ET adjustment factor:

1. With the ET STATION SETTINGS screen displayed, use the arrow buttons to highlight the ET Adjustment factor for the station you want.

```
Auto Stand-Alone              MVs 1 2 3  0.06 Amps
STATION SETTING - PROGRAM A       01:16 pm  01/01/2001
      ET Adj. Days  Total ET  Plant  Precip.  Run Time
Stn   Factor  Since in        Factor in/hr    HH:MM
  1   100%    1     0.05      100%   0.00      00:00
  2   100%    1     0.05      100%   0.00      00:00
  3   100%    1     0.05      100%   0.00      00:00
  4   100%    1     0.05      100%   0.00      00:00
  5   100%    1     0.05      100%   0.00      00:00
  6   100%    1     0.05      100%   0.00      00:00
  7   100%    1     0.05      100%   0.00      00:00
  8   100%    1     0.05      100%   0.00      00:00
Enter the station-level ET Adjustment Factor
        Page      Copy     Clear      Copy Top
        Down               Accum. ET  To All
```

2. Use the number buttons to enter the percentage.

Note: The ET STATION SETTINGS screen provides you with a **Copy/ Paste** button. Press the **Copy** button to copy the current row; the highlight moves to the next row. Highlight the row where you want to paste the information and press the **Paste** button.

Note: The ET STATION SETTINGS screen provides you with a **Copy Top to All** button. Press **Copy Top to All** to copy the value from the first station assigned to the program to all stations assigned.

Note: The day an ET program is created, the ET value or the last 24-hour period will be used to generate schedules. If the ET source is a sensor, the sensor value or the minimum daily ET — whichever is greater — will be used.

Note: If a station is used in more than one program, the ET Adjustment Factor is the same for that station in both programs because the crop coefficient of each station is the same for all programs. To make program level ET adjustments, change the percentage in the corresponding Water Adjustment Percentage column on the ADJUST screen.

Note: ET Programs require an ET Value and station precipitation rate. The ET Value can be viewed or entered on the ET STATION SETTINGS screen. The station precipitation rate is entered from the STATION SETUP screen. See Chapter 4, Setting Precipitation Rates.

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Note: The ET STATION SETTINGS screen provides you with a **Clear Accum. ET** button. Press **Clear Accum. ET** to reset **Total ET** to **zero**. This is useful when setup procedures or sensor installation and testing have caused the controller to store excessive ET values. Clearing accumulated ET will prevent the controller from over-watering.

Setting Start Times

Once you have selected the program's starting method (Standard or Looping) as described in Chapter 5, Selecting Standard or Looping Start Times, you must set the start times. The way in which you set the start times depends upon the type of start time you chose.

To set start times:

1. With the PROGRAMS screen displayed, highlight anywhere in the program row for the start times you want to set.
2. Press the **Start Times** button.

   The START TIMES screen is displayed.
3. Follow the directions below for the type of start time you have selected.

If You Selected Standard

The Standard START TIMES screen allows you to set up to eight start times for each program. Start times appear in ascending order, regardless of the order in which they were entered.

To set a start time:

1. With the Standard START TIMES screen displayed, use the arrow buttons to highlight an unused start time.

2. Use the number buttons to enter the new start time.

Note: All start times must be entered in 24-hour format.

Note: To remove a start time from the list, highlight the start time and press the **Clear** button.

Note: For ET programs, the total calculated run time will be divided equally across the entered start times. For Time and Volume programs, the time or volume set for each station will be repeated in full for each entered start time.

Note: Consider using the Cycle + Soak™ feature as an alternative to setting several start times.

Note: Start times will automatically be displayed chronologically, starting at midnight.

If You Selected Looping

The Looping START TIMES screen allows you to set times to start and stop scheduled watering, as well as a pause time. The **Pause** field tells how long the controller will wait after running through the station's program before running through it again. The default values are **Start Looping At 12:00 am**; **Pause For 00:00**; and **Stop Looping At 12:00 am**.

To set looping times:

1. With the Looping START TIMES screen displayed, use the arrow buttons to highlight the **Start Looping At** field, then use the number buttons to enter the time to start scheduling watering.

```
Auto Stand-Alone              MVs  1  2  3       0.06 Amps
START TIMES - PROGRAM A          01:16 pm       01/01/2001

  LOOP WATERING TIMES

  Start Looping At   12:00 am
  Pause For          00:00          HH:MM
  Stop Looping At    12:00 am




  Enter begin time as HH:MM (24-hour format)
                                    Clear
```
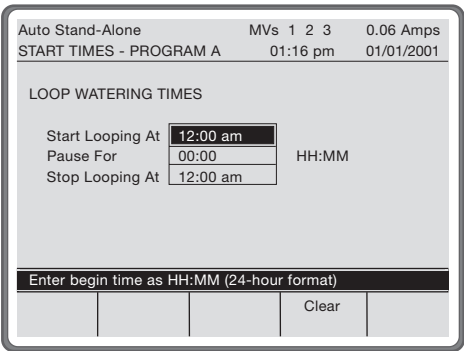
2. Press ▼ to highlight the **Pause For** field, then use the number buttons to enter the amount of time to pause between the end of one program loop and start of the next.

3. Press ▼ to highlight the **Stop Looping At** field, then use the number buttons to enter the time to stop scheduling watering. The process of running through the program then pausing continues until this stop time occurs.

Note: To clear a field and return it to its default values, press the **Clear** button.

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Chapter 6: Adjusting Programmed Watering

The ADJUST screens provide for day-to-day modification of programmed watering. From these screens, you can start a rain delay, adjust the water budget percentage for each program, and set the controller ET value(s).

To get to the ADJUST screen from the MAIN MENU screen:

1. Press the **Adjust** button.

```
Auto Stand-Alone            MVs 1 2 3  0.06 Amps
ADJUST                         01:16 pm  01/01/2001
                Water Adjustment      Rain Delay
Prog  Type  By   Percentage       Days  Remaining
 A    Drip  Time    100%                 00
 B    Drip  Time    100%
 C    Off
 D    Off
 E    Off
 F    Off
 G    Off

Enter Water Budget or Plant Factor

                    ET        Clear      Start
                  Adjust       Row     Rain Delay
```

The ADJUST screen is displayed. The first screen is a table with programs listed on the left side and program characteristics across the top. The **Type** and **By** columns display the information entered in the PROGRAMS screen. For more information, see Chapter 5, Programming the Controller.

2. Complete the adjustment procedures you want as described in this chapter.

3. When you are finished adjusting programs, press ✪ to return to the MAIN MENU screen.

Note: Pressing any key will activate the display.

Note: You can press ✪ at any time to return to the MAIN MENU screen; you can also press ✪ at any time to return to the previous screen.

Note: The **Page Up** and **Page Down** buttons on some portions of the ADJUST screen and related screens allow you to navigate easily from page to page.

Note: The ADJUST screen provides you with a **Clear Row** button. Press the **Clear Row** button to clear the current row and reset all cells to their default values.

Chapter 6: Adjusting Programmed Watering, continued

Setting a Water Adjustment Percentage

You can adjust the program's run time by manipulating the water adjustment percentage. The default is 100%.

To adjust the water budget:

1. With the ADJUST screen displayed, use the arrow buttons to highlight the **Water Adjustment Percentage** cell for the program you want to adjust.

2. Use the number buttons to enter the adjusted percentage (0 – 999%) of each station's total run time, volume, or ET within the selected program.

Note: Water Budget is not available on non-irrigation programs.

Starting Rain Delay

From the ADJUST screen, you can specify the number of days to delay watering and start a rain delay.

To start a rain delay:

1. With the ADJUST screen displayed, use the arrow buttons to highlight the Rain Delay Days Remaining field.

2. Use the number buttons to enter the number of days (0 – 99) that must pass before watering is allowed. Note that the count is reduced at midnight, rather than 24 hours after it is set.

3. Press the **Start Rain Delay** button.

   The rain delay begins.

Note: The rain delay is not activated unless the **Start Rain Delay** button is pressed.

Note: There is only one rain delay for the controller. The delay applies to all programs which have been set to obey the rain delay. See Chapter 5, Using or Not Using Rain Delay.

To cancel a rain delay:

   With the ADJUST screen displayed, press the **Cancel Rain Delay** button.

Chapter 6: Adjusting Programmed Watering, continued

Adjusting Evapotranspiration (ET Programs Only)

For ET programs, you can adjust the ET value. The way you adjust the ET depends upon the ET source you chose in the SETUP screen. For more information, see Chapter 3, Setting Evapotranspiration (ET) Source and Limits.

To adjust the ET:

1. With the ADJUST screen displayed, press the **ET Adjust** button.

   The ET ADJUST screen is displayed.

2. Follow the directions below for the type of ET source you chose on the controller SETUP screen.

If You Selected Weather List

If you selected Weather List for your ET source, you can adjust the ET by selecting a value from a table. The table displays weather conditions on the left side and climate across the top. The units of measure used in the table are those selected at the SETUP screen and are displayed at the top of the table.

To adjust the weather list ET:

With the Weather List ET ADJUST screen displayed, use the arrow buttons to highlight the cell in the table that corresponds to the climate and weather conditions for the site. Press the ◐ button to select this as the daily ET. This value will now be registered in the line titled "Yesterday's ET."

```
Auto Stand-Alone              MVs 1 2 3  0.06 Amps
ET ADJUST                  01:16 pm      01/01/2001
ET Source: Weather List
ET Units: inches)
Yesterday's ET: 0:00
            Cool       Warm         Hot
         Humid  Dry  Humid  Dry  Humid  Dry
Overcast  0.10  0.15  0.15  0.20  0.20  0.30
Partly Sunny 0.11 0.16 0.16 0.21 0.23 0.35
Sunny     0.14  0.19  0.19  0.24  0.28  0.45
Windy     0.15  0.20  0.20  0.25  0.30  0.50

Arrow keys to move, press ♦ key to accept value
```

Warning: The weather list values may not accurately represent the ET at your site. Average ET values must be confirmed by the US weather service, a local weather station, or a certified irrigation professional.

Chapter 6: Adjusting Programmed Watering, continued

If You Selected Entered Value

If you selected Entered Value for your ET source, you can adjust the ET by entering values for each month. The units of measure used in the table are those selected at the SETUP screen and are displayed at the top of the table.

To adjust the entered value ET,

1. With the Entered Value ET ADJUST screen displayed, use the arrow buttons to highlight the **ET** field for the month you want to change.

```
Auto Stand-Alone            MVs  1  2  3   0.06 Amps
ET ADJUST                       01:16 pm   01/01/2001
ET Source: Entered Value
ET Units: inches
Yesterday's ET:  0:00
        Jan   [0:00]      Jul    0:00
        Feb    0:00       Aug    0:00
        Mar    0:00       Sep    0:00
        Apr    0:00       Oct    0:00
        May    0:00       Nov    0:00
        Jun    0:00       Dec    0:00

Enter average daily ET for this month
                              Clear
```

2. Use the number buttons to enter the value.

Note: The Entered Value ET ADJUST screen provides you with a **Clear** button. Press the **Clear** button to clear the current cell.

Note: You cannot enter ET values greater than the Maximum Daily ET entered in the SETUP screen. If you cannot enter large ET values, check your Maximum Daily ET setting.

Note: To enter decimal values, you must enter leading and trailing zeros. For example, you would enter 0-0-1 to get the value 0.01.

Note: The U.S. Weather Service, local weather stations, or a local irrigation professional are good sources of appropriate ET values for your site. Accurate ET Values are critical for protecting plants while maximizing water conservation.

If You Selected ET Sensor

If you selected ET Sensor for your ET source, you cannot adjust the ET. In this case, ET is determined by the ET sensor. For more information, see Chapter 4, Defining Sensor Use. However, you can view the values provided by the sensor for last month, last week, and today.

```
Auto Stand-Alone              MVs 1 2 3  0.06 Amps
ET ADJUST                  01:16 pm  01/01/2001


ET Source: Sensor


      Average ET Value last month:  0.19 in
      Average ET Value last week:  0.22 in
                Yesterday's ET:  0.25 in



This screen is updated every 5 seconds
```

The MANUAL screens allow you to add to the program schedule according to the following rules of precedence:

- Manual operations are performed before automatic operations. When possible, automatic operations will be stacked or performed simultaneously.

- Manual operations will be performed in the order that they have been entered. One manual operation must be completed before another begins.

From the MANUAL screens, you can run a previously set program, set an individual station to run for a specified amount of time, and set master valves to be open until any time through midnight of the current day. These screens also allow you to run various station and hardware tests.

To get to the MANUAL screen from the MAIN MENU screen:

1. Press the **Manual** button.

```
Auto Stand-Alone              MVs ▣ 2 3     0.06 Amps
MANUAL                         01:16 pm    01/01/2001
       Manual     Run Time
 Prog  Run    Stn HH:MM    MV   Status   Until
  A    Yes    1    00:06    1    Open    11:59 pm
  B    No     2    00:00    2    Auto
  C    No     3    00:00    3    Auto
  D    No     4    00:00
  E    No     5    00:00
  F    No     6    00:00
  G    No     7    00:00
              8    00:00
 Add program to schedule when Run
                            Tests     Run
```

The MANUAL screen is displayed.

2. Complete the manual procedures you want as described in this chapter.

3. When you are finished, press ↩ to return to the MAIN MENU screen.

Note: Pressing any key will activate the display.

Note: You can press ↩ at any time to return to the MAIN MENU screen; you can also press ✕ at any time to return to the previous screen.

Note: The **Page Up** and **Page Down** buttons on some portions of the MANUAL screen allow you to navigate easily from page to page.

Note: The MANUAL screen provides you with a **Copy/Paste** button for Run Times. Press the **Copy** button to copy the Run Time of the current row. The **Copy** button changes to a **Paste** button and the highlight moves down one row. Move the highlight to the row where you want to paste the information and press **Paste.**

Running Manual Programs, Stations, or Valves

From the MANUAL screen, you can run an individual station, a predefined program, or a master valve. If you elect to run a program, for standard time and volume programs, this is equivalent to running one start time; for an ET program, the program will run based on the ET for the last 24-hour period; for looping programs, this is equivalent to running all programmed stations once then stopping.

To run manual programs or stations:

1. If you want to run an entire program, with the MANUAL screen displayed, use the arrow buttons to highlight the **Manual Run** field that corresponds to the program you want to run, then press ◐ to toggle between **Yes** and **No**. Repeat this process to run additional programs.

Auto Stand-Alone				MVs 1 2 3	0.06 Amps
MANUAL				01:16 pm	01/01/2001

Prog	Manual Run	Stn	Run Time HH:MM	MV	Status	Until
A	Yes	1	00:00	1	Auto	
B	No	2	00:00	2	Auto	
C	No	3	00:00	3	Auto	
D	No	4	00:00			
E	No	5	00:00			
F	No	6	00:00			
G	No	7	00:00			
		8	00:00			

Add program to schedule when Run

			Tests	Run

2. If you want to run an individual station, use the arrow buttons to highlight the **Run Time** field that corresponds to the station you want to run, then use the number buttons to enter the run time. Repeat this process to run additional stations.

```
Auto Stand-Alone              MVs 1 2 3    0.06 Amps
MANUAL                           01:16 pm   01/01/2001
      Manual    Run Time
Prog  Run   Stn  HH:MM    MV   Status   Until
 A    Yes    1   00:10     1   Auto
 B    No     2   00:00     2   Auto
 C    No     3   00:00     3   Auto
 D    No     4   00:00
 E    No     5   00:00
 F    No     6   00:00
 G    No     7   00:00
             8   00:00
Run time (HH:MM) of each station
            Page      Copy    Tests      Run
            Down
```

3. Once you have set up the programs and/or stations you want to run, press the **Run** button to begin running them.

```
Auto Stand-Alone              MVs 1 2 3    0.06 Amps
MANUAL                           01:16 pm   01/01/2001
      Manual    Run Time
Prog  Run   Stn  HH:MM    MV   Status   Until
 A    Ye
 B    N             0% complete
 C    N
 D    N     0    25     50     75    100
 E    N
 F    N
 G    No
             8   00:00
Add program to schedule when Run
            Page      Copy    Tests      Run
            Down
```

A confirmation message appears on the hint line. Once started, programs and stations can only be canceled by using the **Advance Stations** feature on the STATUS DETAILS screen.

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```
Auto Stand-Alone          MVs 1 2 3      0.06 Amps
STATUS DETAILS                  01:16 pm   01/01/2001
Auto                                    Cycle
Man  Prog   Stn      Start    Stop    & Soak
 M    A     3        1:00     4:50      Y
 A    B     6        9:20    11:30      N



Press Advance Station to remove Stn. from schedule
                     Sensor   Advance   Pause
                     Status   Station
```

The STATUS DETAILS screen will appear with the Manual operations listed in detail. To return to the MANUAL screen, press ↺.

4. If you want to run a master valve, use the arrow buttons to highlight the **Status** field for the master valve you want to open, then press ○ to set the valve to **Open**. The master valve will immediately activate. Then, press ⬤ to highlight the **Until** field and enter the time until which you want the valve to remain open. To close the master valve, press ○ again.

```
Auto Stand-Alone          MVs ▣ 2 3      0.06 Amps
MANUAL                          01:16 pm   01/01/2001
      Manual    Run Time
Prog  Run   Stn  HH:MM   MV   Status   Until
 A    No     1   00:06    1   Open    02:05pm
 B    No     2   00:00    2   Auto
 C    No     3   00:00    3   Auto
 D    No     4   00:00
 E    No     5   00:00
 F    No     6   00:00
 G    No     7   00:00
             8   00:00
Enter end time as HH:MM (24-hour format)
             Page    Copy    Tests    Run
             Down
```

Note: Master valve status is dictated first by programs. If a program requires a master valve be open, it will be open. To remove a master valve from program control, the program must be canceled.

Note: The MVs readout at the top of the display highlights open master valves.

Note: The manual programs and stations will not run unless you press the **Run** button.

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Running Tests

The MANUAL screen allows you to run tests on all stations, as well as Flows and Amps tests and hardware tests.

To run tests:

1. With the MANUAL screen displayed, press the **Tests** button.

   The TESTS-ALL STATIONS screen is displayed.

2. Perform the test procedures you want as described in this section.

Testing All Stations

The TESTS-ALL STATIONS screen allows you to test all installed stations. This screen is equivalent to using the MANUAL screen and setting all station entries to the same run time. By using this screen, you can walk the entire irrigation system while the controller is turning stations on and off in sequence. You set the initial delay time and the run time for each station.

To test all stations in sequence:

1. With the TESTS-ALL STATIONS screen displayed, use the arrow buttons to highlight the **Delay Before Test** field, then use the number buttons to enter the amount of time before testing should begin.

```
┌─────────────────────────────────────────────┐
│ Auto Stand-Alone          MVs  1 2 3   0.06 Amps │
│ TESTS-ALL STATIONS             01:16 pm   01/01/2001 │
│                                              │
│ TEST ALL STATIONS                            │
│                                              │
│   Delay Before Test    [00:00]  MM:SS        │
│   Station Run Time      02:00   MM:SS        │
│                                              │
│                                              │
│                                              │
│ ▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄       │
│ Delay time (MM:SS) before starting test run  │
│ ┌────────┬──────┬────┬──────┬──────┐         │
│ │ Flows &│ Page │    │ Clear│ Run  │         │
│ │Amps Tests│    │    │      │      │         │
│ └────────┴──────┴────┴──────┴──────┘         │
└─────────────────────────────────────────────┘
```
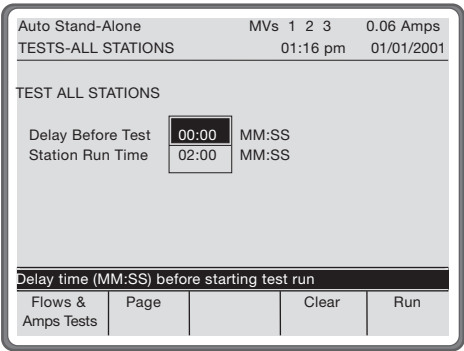
2. Press ▼ to highlight the **Station Run Time** field, then use the number buttons to enter the amount of time you want each station to run.

3. When you are ready to run the test, press the **Run Tests** button.

   Installed stations run in sequence and the **Run Tests** button toggles to a **Cancel Test** button. To cancel the test, press the **Cancel Test** button. As the test runs, the status of each station is displayed on the screen:

   • **Complete** — means the test has been completed on that station.

- **Testing** — means testing is in progress on that station.
- **Pending** — means that station has yet to be tested.

Running the Flows and Amps Tests

The Flows and Amps tests measure water flow and electrical current consumption for each station and master valve. The flow and current values measured during these tests are recorded in the controller's memory, or "learned," for use in keeping logs and managing irrigation schedules. While the Flows and Amps tests are in progress, all other activity is suspended until the end of the test. In addition, you should not hand water during the test.

To run a Flows test:

1. With the TESTS-ALL STATIONS screen displayed, press the **Flows & Amps Tests** button.

```
┌─────────────────────────────────────────────────┐
│ Auto Stand-Alone          MVs 1 2 3    0.06 Amps │
│ FLOWS AND AMPS TESTS          01:16 pm  01/01/2001│
├─────┬──────────────────────────────────────────── │
│ Stn │ Status                                       │
│  1  │ Pending                                      │
│  2  │ Pending  Runs each installed station to read │
│  3  │ Pending  electric current and water flow values│
│  4  │ Pending                                      │
│  5  │ Pending  >>Do NOT hand water during test<<   │
│  7  │ Pending                                      │
│  8  │ Pending  Values reported on STATION SETUP screen│
│  9  │ Pending  Faulty stations reported on LOGS screen│
│     │                                              │
│ Hardware              Run Amps    Run Flows       │
│ Tests                 Test        Test            │
└─────────────────────────────────────────────────┘
```

The FLOWS AND AMPS TESTS screen is displayed.

2. Press the **Run Flows Test** button.

   The test begins to run and the **Run Flows Test** button toggles to a **Cancel Test** button. To cancel the test, press the **Cancel Test** button. As the test runs, the status of each station is displayed on the screen:

   - **Complete** — means the test has been completed on that station.
   - **Testing** — means testing is in progress on that station.
   - **Pending** — means that station has yet to be tested.

   When the test is completed, values are displayed on the STATION SETUP screen, faults are reported on the LOG screen.

To run an Amps test:

1. With the TESTS-ALL STATIONS screen displayed, press the **Flows & Amps Tests** button.

```
Auto Stand-Alone              MVs 1 2 3    0.06 Amps
FLOWS AND AMPS TESTS          01:16 pm    01/01/2001
Stn  Status
1    Pending
2    Pending   Runs each installed station to read
3    Pending   electric current and water flow values
4    Pending
5    Pending   >>Do NOT hand water during test<<
7    Pending
8    Pending   Values reported on STATION SETUP screen
9    Pending   Faulty stations reported on LOGS screen


Hardware                      Run Amps  Run Flows
 Tests                          Test       Test
```

The FLOWS AND AMPS TESTS screen is displayed.

2. Press the **Run Amps Test** button.

    The test begins to run and the **Run Amps Test** button toggles to a **Cancel Test** button. To cancel the test, press the **Cancel Test** button. As the test runs, the status of each station is displayed on the screen:

    *   **Complete** — means the test has been completed on that station.

    *   **Testing** — means testing is in progress on that station.

    *   **Pending** — means that station has yet to be tested.

    When the test is completed, values are displayed on the STATION SETUP screen, faults are reported on the LOG screen.

Running the Hardware Tests

You can run any of four diagnostic hardware tests:

*   **Keypad Test** — When you start this test, you can touch any button on the keypad and the display will let you know that the button is recognized.

*   **LCD Test** — When you start this test, the LCD turns on completely so that you can tell if the LCD is functioning properly.

*   **RAM Test** — When you use this test, the controller writes to every RAM location and then rereads the data to determine if the controller holds valid data. At the completion of the test, the hint line will display a message indicating whether the controller passed the test.

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- **Relay Test** — When you use this test, the controller checks the functioning of each station's relay. You should be able to hear the click of the relay, see the red LED light next to the field wire connector, and see the "Relays test initiated" and "Relays test completed" messages on the screen.

Note: If the relays click but the LEDs do not light during the relay test, the fuse in the transformer has probably blown. Turn the transformer power switch off, open the cover marked "FUSE" and install a new 3.0 Amp SLO-BLO fuse. Replace the fuse cover and turn the transformer power switch on.

To run any one of these tests:

1. With the FLOWS AND AMPS TESTS screen displayed, press the **Hardware Tests** button.

   The HARDWARE TESTS screen is displayed.
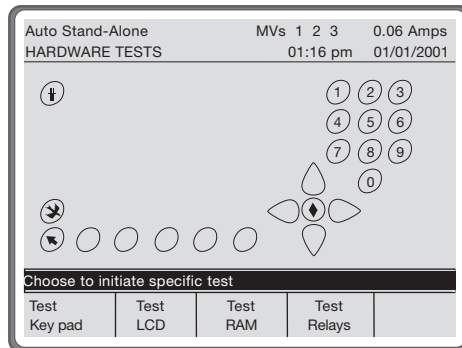
2. Press the button that corresponds to the test you want to run.

   The test you chose runs and results appear in the display.

Note: The LCD Display Test may take several minutes to execute.

Chapter 8: Checking Status

The STATUS screens present a graphic depiction of the day's schedule as well as details of each station's and each sensor's activity. To get to the STATUS screen from the MAIN MENU screen:

1. Press the **Status** button.

```
Auto Stand-Alone          MVs 1 2 3  0.06 Amps
STATUS                     01:16 pm  01/01/2001
  12:00AM    6:00AM     12:00PM    6:00PM



Language - English (US)
                                Status      Log
                                Details
```
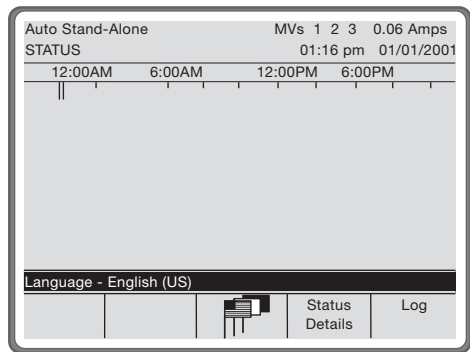
The STATUS screen is displayed.

2. Complete the procedures for checking the type of status you want as described in this chapter.

3. When you are finished, press ☺ to return to the MAIN MENU screen.

Note: Pressing any key will activate the display.

Note: You can press ☺ at any time to return to the MAIN MENU screen; you can also press ☺ at any time to return to the previous screen.

Note: The **Page Up** and **Page Down** buttons on some portions of the STATUS screen and the STATUS DETAILS screen allow you to navigate easily from page to page.

Viewing Controller Activity

On the left side of the STATUS screen is a list of programs that have run or are scheduled to run on the current day. This list includes automatically scheduled programs and manually run programs and stations.

To the right of the program list is a graphical representation of program and station activity. In this display, the present time is represented by a dotted vertical line. Watering activity is represented by solid lines aligned with the corresponding program or station on the list. A sprinkler icon appears on the right of every program or station that is currently active. (This includes irrigation, drip and non-irrigation programs.)

Time outside the water window is indicated by a hashed area. See the illustration below for a key for the appearance of watering permitted outside the water window, watering not permitted outside the water window, and watering within the water window.
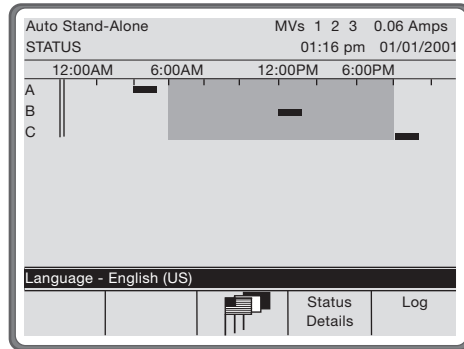
Changing the Display Language

You can change the language used in the display. Available languages are: **English, Spanish,** and **French**.

To change the display language:

   With the STATUS screen displayed, press 📺 to cycle through the available languages.

   Each press shows a different language in the display. The default setting is **English**.

Viewing Status Details

The STATUS DETAILS screen allows you to see each station's scheduled run time for the remainder of the controller day in a tabular, chronological format. It also provides access to the SENSOR STATUS screen.

To view station status details,

With the STATUS screen displayed, press the **Status Details** button.

```
┌─────────────────────────────────────────────┐
│ Auto Stand-Alone          MVs 1 2 3  0.06 Amps│
│ STATUS DETAILS               01:16 pm  01/01/2001│
│ ┌────┬─────┬────┬───────┬───────┬───────┐   │
│ │Auto│     │    │       │       │ Cycle │   │
│ │Man │Prog │Stn │ Start │ Stop  │ & Soak│   │
│ │ A  │  A  │ 1  │06:00am│06:10am│   N   │   │
│ └────┴─────┴────┴───────┴───────┴───────┘   │
│                                               │
│ No activity presently scheduled               │
│ ┌─────┬─────┬────────┬────────┬───────┐     │
│ │     │     │ Sensor │Advance │ Pause │     │
│ │     │     │ Status │Station │       │     │
│ └─────┴─────┴────────┴────────┴───────┘     │
└─────────────────────────────────────────────┘
```
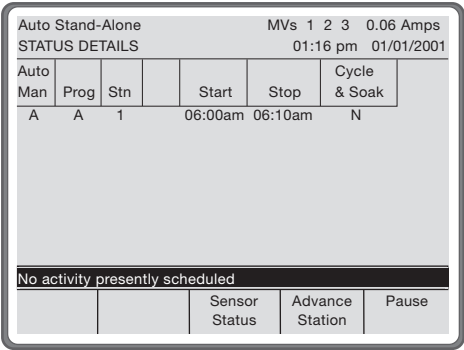
The STATUS DETAILS screen is displayed. From this screen, you can:
- See the programs scheduled to run for the day.
- See whether the programs are automatic or manual.
- See the station(s) scheduled to run for the day.
- See a ⯭ icon, which indicates that the station is on.
- See the start and stop times for each program.
- See whether the station is using Cycle + Soak™.
- Access the SENSOR STATUS screen.

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Canceling Watering

You can cancel any manual or automatic program you have started by advancing the program to the next station. **Advance Station** stops the selected manual operation permanently, or the selected automatic program until the next scheduled watering day.

To cancel a particular station:

1. With the STATUS DETAILS screen displayed, use the arrow buttons to highlight the item you want to cancel, then press the **Advance Station** button.

    The item you highlighted is canceled and the highlight moves to the next item. The next item begins at its scheduled time, or if it is dependent, it advances to the earliest possible start time.

Pausing Watering

In cases where you do not wish to cancel watering, you can pause all watering until you elect to continue. Pausing shuts down all stations except those assigned to non-irrigation programs using the controller's delay between stations settings. If you remove the pause, stations will begin running according to the **Events Proceed Method** setting in the SETUP screen. For more information, see Chapter 3, Setting Program Controls.

To pause watering:

1. With the STATUS DETAILS screen displayed, press the **Pause** button.
2. The **Pause** button toggles to a **Continue** button. Press **Continue** to resume watering.

Note: If you press the **Pause** button but do not subsequently press the **Continue** button, the pause will continue indefinitely. You must press the **Continue** button for regular irrigation to resume.

Chapter 8: Checking Status, continued

Viewing Sensor Status

The SENSOR STATUS screen allows you to see the current status of each sensor. This screen is not editable.

To view sensor status information:

1. With the STATUS DETAILS screen displayed, press the **Sensor Status** button.

   The SENSOR STATUS screen is displayed.

```
Auto Stand-Alone              MVs  1  2  3   0.06 Amps
SENSOR STATUS                       01:16 pm   01/01/2001

     Use       Inhibits      Reading     Units
  1  Freeze    Open          Closed
  2  Rain      Open          Open
  3   –
  4   –
  5   –
  6   –


  This screen is updated every 5 seconds

```

For each sensor, the following information is available:

- **Use** — shows the use information entered in the SENSOR SETUP screen.
- **Inhibits** — shows the inhibit information entered in the SENSOR SETUP screen.
- **Reading** — displays the most recent sensor input.
- **Units** — shows the units of measure entered in the SENSOR SETUP screen.

Note: For more information, see Chapter 4, Setting Up Sensors.

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Chapter 8: Checking Status, continued

Viewing the Log

The LOG screen shows a list of alarms and selected events. Each entry is shown with the date and time of occurrence. Five kinds of entries are possible:

- **Alarm** — a condition that requires attention.
- **Error** — a condition the controller cannot justify, such as a keypad malfunction.
- **Access Event** — attempts to enter a password or programming changes.
- **Sensor Event** — environmental conditions exceeding sensor limit thresholds and the effect on station watering.
- **Water Event** — opening and closing of station and master valves by programmed and manual watering.

To view the LOG screen:

With the STATUS screen displayed, press the **Log** button.

```
Auto Stand-Alone           MVs 1 2 3   0.06 Amps
LOG                          01:16 pm   01/01/2001

Date
MM/DD  Time              Description
01/01  01:15 pm          Setup modified
01/01  01:15 pm      1   MV opened
01/01  01:15 pm          Power up reset
01/01  01:13 pm          CONTROLLER POWER FAILURE
01/01  01:13 pm          Sensor setup modified
01/01  01:13 pm     01   Sensor canceled station(s)
01/01  01:13 pm      3   Station canceled by sensor
01/01  01:13 pm     01   Sensor interrupts station(s)
This screen is updated every 5 seconds
          Page                  Water
          Down                  Flows
```

The LOG screen is displayed.

Viewing Flow Data

The WATER FLOWS screen shows estimated and actual water flows. Units of measure are those specified in the SETUP screen.

To view flow data:

1. With the STATUS screen displayed, press the **Log** button.

   The LOG screen is displayed.

2. Press the **Water Flows** button.

```
Auto Stand-Alone              MVs  1  2  3    0.06 Amps
WATER FLOWS                      01:16 pm   01/01/2001
       Present    This      Last      Since
       Rate       Month     Month     01/01/2001
       gpm(US)    gal(US)   gal(US)   gal(US)
Est       0          0         0         0
MV1       0          0         0         0
MV2       0          0         0         0
MV3       0          0         0         0
Total     0          0         0         0


This screen is updated every 5 seconds
                                              Reset
                                              Date
```

The WATER FLOWS screen is displayed with the following data:

- **Present Rate** — the rate at which water is currently being used.

- **This Month** — the total water volume accumulated so far in the current month.

- **Last Month** — the total water volume accumulated during the previous month.

- **Since** (date) — the total water volume accumulated since the date displayed. You can reset this date to the current date. See below.

The **Total** row is the sum of actual flow meter readings, measured when sensors Flow MV1, Flow MV2, and Flow MV3 are set up on the SENSOR SETUP screen. The **Estimated** (**EST**)row is based on the estimated station water use as defined in the STATION SETUP screen. **Master Valve** (**MV1**, **MV2** and **MV3**) rows show flow meters and the accumulated use attributed to each of them.

To reset the date on the **Since** column:

1. Press the **Reset Date** button.

    Confirm and **Cancel** buttons are displayed.

2. Press the **Confirm** button to reset the field to the current date, or press the **Cancel** button to return the field to the date that was displayed prior to pressing the **Reset Date** button.

Note: The **Reset Date** button is password protected with the same password needed to change programs and setup.

Adding Stations

You can add stations to your IM controller.

1. Purchase station output card(s) (four stations per card) corresponding to the number of stations you would like to add to the IM controller. You may need to purchase an additional output box as well. Each box can hold four station output cards (sixteen stations).

2. Turn off the power switch.

3. Open the controller's coverplate (inner door).

4. Loosen the retaining clips on either side of the CPU box and remove the CPU box from the controller.
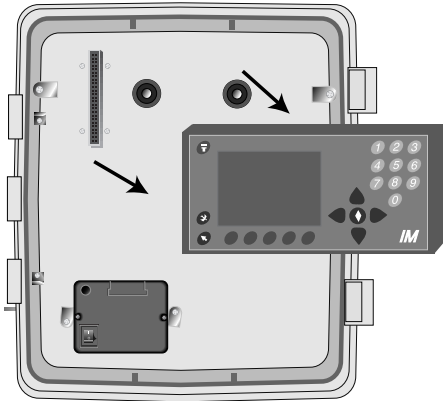
5. Remove the shelf beneath the station output boxes.

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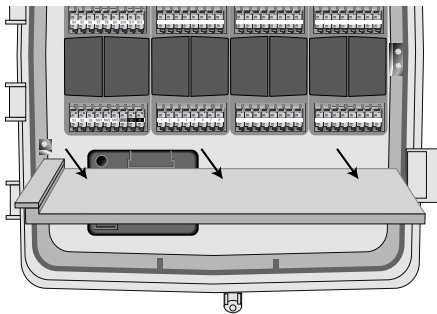
Chapter 9: Installing Upgrades, continued

6. Remove the appropriate output box. (Example: if you are adding stations 13-16, remove the second box from the left.)
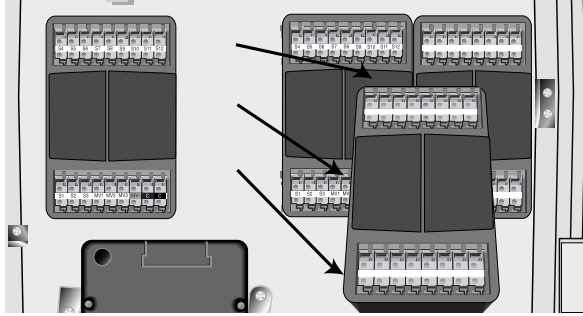
7. Slide the new four-station output card into the appropriate slot until it locks into place.

   Note: The slots in each output box are numbered 1, 2, 3 and 4. They must be filled in that order.

8. Replace the output box.
9. Replace the shelf.
10. Replace the CPU box. Take care to align the guides on top of the CPU box with the molded plastic bracket inside the cabinet. Seat the CPU box firmly and tighten the retaining clips.
11. Turn on the power switch.
12. Go to the SETUP screen and change the **Installed Stations** setting in the About This Controller section to the appropriate station count. (Example: if you converted from a 12- to a 16-station controller, change the number from 12 to 16.)

Adding Stations 25-28

If you are adding stations 25-28, before you insert the station output cards into the controller, you must first:

1. Purchase an IM Extended Stations card.
2. Turn off the power switch.
3. Loosen the retaining clips on either side of the CPU box and remove the CPU box from the controller.

4. Remove the four Phillips screws that hold the CPU box together.

5. Carefully remove the CPU top. You will have to unplug two ribbon cables leading to the CPU top while doing so.
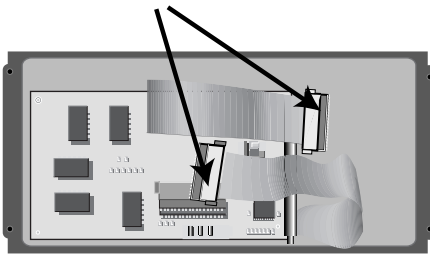
6. Remove the four Phillips-head screws holding the two light gray card guides in place and then remove the card guides.
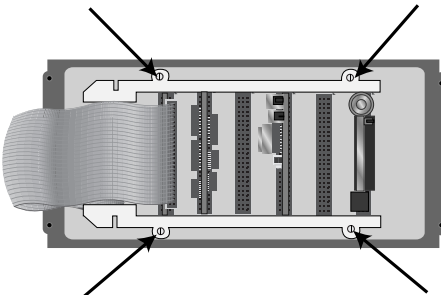
7. Insert the Extended Stations I/O card into any open slot.

8. Plug one end of the ribbon cable into the connector at the top of the Extended Stations I/O Card. Plug the other end of the ribbon connector into the inside bottom left of the CPU Box.

9. Replace the two light gray card guides and the four Phillips-head screws holding the guides in place.

10. Replace the CPU top. Be sure to reconnect the two ribbon cables.

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11 Replace the four Phillips-head screws holding the CPU box together.

12. Replace the CPU box. Take care to align the guides on top of the CPU box with the molded plastic bracket inside the cabinet. Seat the CPU box firmly and tighten the retaining clips.

13. Turn on the power switch.

14. Follow the instructions above for installing additional stations.

Adding Sensor Inputs

1. Purchase the appropriate switched and/or pulse sensor card(s).
2. Turn off the power switch.
3. Loosen the retaining clips on either side of the CPU box and remove the CPU box from the controller.
4. Remove the shelf beneath the station output boxes.
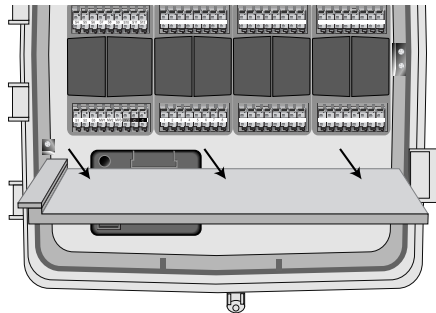
5. Remove the MV-Sensor box (far left hand box).
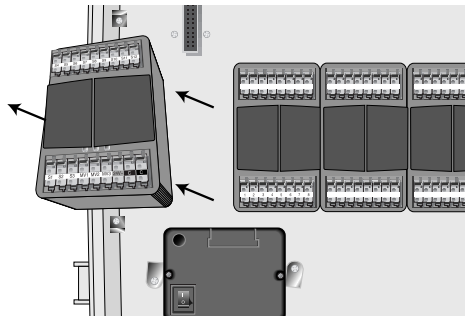
6. Slide the new sensor card into the appropriate slot until it locks into place. Take note of the slot in which you placed the sensor card. Slot numbers are marked on the side of the MVS box.

    - **Slot #1** – Sensors 1-3

    - **Slot #2** – Sensors 4-6

    - **Slot #3** – Sensors 7-9

    - **Slot #4** – Sensors 10-12

7. Replace the output box.

8. Replace the shelf.

9. Replace the CPU box. Take care to align the guides on top of the CPU box with the molded plastic bracket inside the cabinet. Seat the CPU box firmly and tighten the retaining clips.

10. Turn on the power.

11. Go to the SETUP screen and update the About This Controller section to reflect the number and location of pulse and switched sensor cards.

12. To install and configure sensors, see Chapter 4, Setting Up Sensors.

Resetting the Controller

In rare instances, it may be necessary to completely clear the controller's memory.

Warning! This process will erase all programming and setup information stored in the controller. You may want to record setup and programming information before resetting the controller. After the reset, you must repeat all setup and programming steps. See Chapters 3, 4, 5 and 6.

1. Turn the controller power switch on the transformer to the "off" position.
2. Press and hold the **2** and **3** buttons on the keypad.
3. Turn the controller power switch "on". Continue holding the **2** and **3** buttons until the main menu appears on the display.
4. The time and date will be reset to midnight, 01/01/2001 indicating a successful reset.

Note: The controller setup will revert to its base configuration of twelve stations and three sensor inputs installed. If the controller has more than twelve stations or more than three sensor inputs, you must update the controller settings. See Chapter 3, Setting Information About the Controller.

Troubleshooting

The following pages contain possible problems you may encounter and some solutions. Before calling Rain Bird, check this list. If you cannot solve the problem yourself, call our Technical Service Hotline at 800-247-3782.

General Troubleshooting

For all IM Controller problems, it is always best to start by looking at the LOG screen, the STATUS screen and the STATUS DETAILS screen. For controllers using sensors, the SENSOR STATUS screen is also helpful. For more information on these screens, see Chapter 8, Checking Status.

The LOG screen shows a list of alarms and selected controller events. It will show system alarms, power outages, sensor activity that canceled or interrupted station operation, and other significant controller events that may affect program operation.

The STATUS screen and STATUS DETAILS screen provide a graphic depiction of the day's schedule as well as details of each station's and each sensor's activity. These screens allow you to see programs that have already run during the day as well as programs that are scheduled to run later in the day.

The SENSOR STATUS screen allows you to see the current status of each sensor. It is helpful in determining whether the controller is accurately reading a sensor, and whether a sensor's current reading will affect program operation.

Problem	The power to the controller was interrupted for an extended period of time
Solution	The lithium battery inside the CPU box maintains the time, date and irrigation schedule for up to 10 years during a power outage. When there is a power outage, the display will be blank and no programs will run. When power is restored, regular program operation will resume.
Problem	Parts are missing or damaged
Solution	Try one of the following solutions: Damage occurred during shipping. Order replacements for damaged parts or modules from your Rain Bird distributor or return the controller for warranty repair or replacement.

Troubleshooting, continued

Solution	Lightning has damaged the controller. If the controller is installed, replace the component that is damaged. Almost all IM Controller subassemblies and circuit boards are available as replacement parts.
Problem	The controller is dead; the display is blank and there is no station output
Solution	Try one of the following solutions: There is no power to the controller. Check that the main power source is on. There is no power to the controller. Check that the controller power switch located on the transformer is in the "on" position. The main power source is not connected properly to the transformer. This connection should be checked by a qualified electrician, following the instructions in Chapter 1, Connections to the Main Power Source. The transformer is not connected properly to the controller. Shut down the power to the controller. Then check that the 8-wire cable from the transformer is properly connected to J9 on the CPU Junction Assembly (the circuit board in the back of the cabinet). The transformer is bad. Check if there are 24 VAC between the "24V" and "COM" terminals. The CPU box (the box containing the screen and keypad) is not seated correctly in the controller. Remove and reinstall the box to reseat the connector. See Chapter 9, Adding Stations.
Problem	The display and programming operate normally, but stations and master valves will not activate
Solution	View the LOG screen View the STATUS screen

Troubleshooting, continued

Solution	View the STATUS DETAILS screen
	Try one of the following solutions:
	If the controller's display is active but the LED above the 24V connector on the Master Valve/Sensor Assembly is not illuminated, the fuse in the transformer has blown. Replace the 3.0 Amp Slo-Blo fuse in the transformer assembly.
	If the controller runs a program and the relays click, but the LEDs above the station terminals do not light, the fuse in the transformer has blown. Replace the 3.0 Amp Slo-Blo fuse in the transformer assembly.
	If the controller runs a program, the LEDs light and the relays click, there is probably a common wire problem. Run a station test to activate all stations. See Chapter 7, Running Tests.
	Watering has been interrupted or canceled by a sensor. Check the LOG screen for records of sensor activity. Check the SENSOR STATUS screen to view current sensor status and inhibit conditions.
Problem	The controller will not execute a programmed schedule
Solution	View the LOG screen
	View the STATUS screen
	View the STATUS DETAILS screen
	Try one of the following solutions:
	The controller has been set to **off**. The controller should display the word "Auto" (for automatic operation) in the upper left-hand corner of the screen. If it displays the word "Off," press the **Auto/Off** button (the button with the sprinkler icon in the upper left-hand corner of the keypad) to turn the controller to **auto**. See Chapter 2, The Controller's Front Panel.
	The controller has been set to **pause**. The controller should display the word "Auto" in the upper left-hand corner of the screen. If it displays the word "Pause,"

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Solution	you must press the **Continue** button from the STATUS DETAILS screen to resume program operation. See Chapter 8, Pausing Watering.
	The controller has been set to operate under **Central Control**. The controller should display the word "Stand-Alone" in the upper left-hand corner of the screen. If it displays the word "Central," you must set the controller to **Stand-Alone** in the SETUP screen. See Chapter 3, Setting Site Values.
	The rain delay feature has been activated. When the rain delay feature is active, the words "RAIN DELAY" appear on the top row of the controller display. To see the number of days remaining or to cancel the rain delay, use the ADJUST Screen. See Chapter 6, Starting Rain Delay.
	The water budget for one or more programs has been set to **0%**. Check the ADJUST screen to view or modify water budget settings for each program. See Chapter 6, Setting a Water Adjustment Percentage.
	There is no start time programmed for one or more programs. Check the START TIMES screen for each program. See Chapter 5, Setting Start Times.
	There are no stations associated with one or more programs. Check the ASSIGN STATIONS screen to view the stations assigned to each program. See Chapter 5, Assigning Stations to Programs.
	Today is a non-watering day or an omit watering day. View the WATER CALENDAR screen for each program. If this is a non-watering day, there will be no sprinkler icon for this day on the calendar. If this is an omit watering day, there will be a circle with a slash through it (with or without a sprinkler icon) for this day on the calendar. To change watering days see Chapter 5, Setting Water Days. To change omit watering day settings, see Chapter 5, Canceling Watering on Particular Calendar Days.
	The defined water window is too short to allow all programmed watering. View the STATUS SCREEN to see scheduled program operation and the water window. Change the water window to allow enough time for all programs to execute. See Chapter 3, Setting Site Values.
	Watering has been interrupted or canceled by a sensor. Check the LOG screen

Solution	for records of sensor activity. Check the SENSOR STATUS screen to view current sensor status and inhibit conditions.
	The controller has reached its **Maximum Monthly Volume** setting. Once monthly flow reaches this number, the controller will halt all irrigation until the following month. Compare the **Maximum Monthly Volume** setting on the SETUP screen to the total recorded flow for the current month on the WATER FLOWS screen. See Chapter 3, Setting Program Controls and Chapter 8, Viewing Flow Data.
	See additional solutions for time, volume or ET-based schedules below.
Problem	A station will not activate
Solution	View the LOG screen
	View the STATUS screen
	View the STATUS DETAILS screen
	Try one of the following solutions:
	There is a short circuit in the valve wiring or solenoid. In this case, the controller will display an alarm and log the fault. Check the LOG screen. Check the station wiring and the solenoid. After the short circuit is repaired, run the amps test to reset the controller. See Chapter 7, Running the Flows and Amps Tests.
	There is a defective relay. Run a relay test. See Chapter 7, Running the Hardware Tests. If a relay fails, replace the affected 4-Station Relay Card.
	No relay card has been installed for this station. Each Station Assembly contains connections for all sixteen stations and slots for up to four 4-Station Relay Cards. Remove the Station Assembly to confirm that a relay card is installed for the desired station(s). See Chapter 9, Adding Stations.
	The station is not associated with any programs. Check the ASSIGN STATIONS screen to view the stations assigned to each program. See Chapter 5, Assigning Stations to Programs.

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Troubleshooting, continued

Solution	There is no start time for the program containing the desired station. Check the START TIMES screen for the appropriate program. See Chapter 5, Setting Start Times.
	Watering has been interrupted or canceled by a sensor. Check the LOG screen for records of sensor activity. Check the SENSOR STATUS screen to view current sensor status and inhibit conditions.
	The estimated or measured flow for the station exceeds the controller's **Max Water Flow Rate** setting. In this case, the station will never operate. Compare the **Max Water Flow Rate** setting on the SETUP screen to the station's estimated and measured flow values on the STATION SETUP screen. See Chapter 3, Setting Program Controls; Chapter 4, Setting Estimated Water Flow; Chapter 4, Viewing Measured Water Flow.
	See additional solutions for time, volume or ET-based schedules below.
Problem	A time-based schedule will not run, or a station will not run on a time-based schedule
Solution	View the LOG screen
	View the STATUS screen
	View the STATUS DETAILS screen
	Try one of the following solutions:
	There is no programmed run time for a station or stations. Check the STATION SETTINGS screen for each program to view the programmed run times. See Chapter 5, Station Settings If You Selected Program by Time.
	See the solutions listed under "The controller will not execute a programmed schedule" and "A station will not activate" for additional solutions.

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Troubleshooting, continued

Problem	A flow-based schedule will not run, or a station will not run on a flow-based schedule
Solution	View the LOG screen
	View the STATUS screen
	View the STATUS DETAILS screen
	Try one of the following solutions:
	There is no programmed volume for a station or stations. Check the STATION SETTINGS screen for each program to view the programmed volumes. See Chapter 5, Station Settings If You Selected Program by Volume.
	There is no estimated or actual flow rate defined for a station or stations. Check the STATION SETUP screen to view each station's estimated and measured flow values. If necessary, enter estimated water flows for each station. To record measured flow for each station (with a flow meter connected the controller) run a Flows Test. See Chapter 4, Setting Estimated Water Flow; Chapter 4, Viewing Measured Water Flow; Chapter 7, Running the Flows and Amps Tests.
	See the solutions listed under "The controller will not execute a programmed schedule" and "A station will not activate" for additional solutions.
Problem	An ET-based schedule will not run, or a station will not run on an ET-based schedule.
Solution	View the LOG screen
	View the STATUS screen
	View the STATUS DETAILS screen
	Try one of the following solutions:
	The ET Source has been defined as **Weather List** but no ET value has been selected from the weather list. View and change the selected ET Value from the weather list using the ET ADJUST screen. See Chapter 6, Adjusting Evapotranspiration

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Solution	If You Selected Weather List.
	The ET Source has been defined as **Entered Value** but no ET value has been entered for the current month, or the current month's ET value is set to zero. View and modify the monthly ET Values on the ET ADJUST screen. See Chapter 6, Adjusting Evapotranspiration If You Selected Entered Value.
	The ET Source has been defined as **ET Sensor** but no ET sensor has been connected or set up. You must connect an ET sensor to the controller and follow the necessary setup procedures for the controller to accept and correctly interpret the sensor data. See Chapter 4, Setting Up Sensors.
	The ET Source has been defined as **ET Sensor**, the sensor has been set up but no ET has been read from the sensor. Check the sensor settings for the proper sensor calibration. See Chapter 4, Setting Up Sensors. Check the sensor for malfunctions.
	No precipitation rate has been entered for a station or stations. To irrigate by ET, the controller must have entered precipitation rates for all stations on ET-based programs. View and adjust the precipitation rate for each station using the STATION SETUP screen. See Chapter 4, Setting Precipitation Rates
	The ET Adjust factor for one or more stations has been set to **0%**. Check the STATION SETTINGS screen for each ET-based program to view or modify ET Adjust settings for each program. See Chapter 5, Station Settings If You Selected Program by ET.
	See the solutions listed under "The controller will not execute a programmed schedule" and "A station will not activate" for additional solutions.
Problem	The controller activates stations at unexpected times
Solution	View the LOG screen
	View the STATUS screen
	View the STATUS DETAILS screen

Troubleshooting, continued

Solution	Try one of the following solutions: The water window is delaying scheduled station starts. Check the water window setting in the SETUP screen. Review the PROGRAM screen to identify programs that obey the water window. See Chapter 3, Setting Site Values and Chapter 5, Using or Not Using the Water Window. Watering has been delayed (interrupted) by a sensor. Check the LOG screen for records of sensor activity. A program did not run completely on its last scheduled irrigation day. The controller will carry over unfinished programs and try to complete them on the next allowed irrigation day (any day not designated as an omit day). Check the LOG screen to identify programs that were in process at midnight on the last scheduled irrigation day. Check the WATER CALENDAR screen to view allowed irrigation days and omit days. See Chapter 5, Canceling Watering on Particular Calendar Days. Additional program start times have been entered accidentally. Check the START TIMES screen for each program. See Chapter 5, Setting Start Times. Stations may be wired to the wrong terminal locations. Check which station wires lead to which zone by touching the hot wire (one station at a time) to the 24V hot post on the (controller) transformer. When you confirm that the wiring turns on the desired zone, reconnect the wire to the corresponding station. The stations are associated with the wrong programs. Check the ASSIGN STATIONS screen to view the stations assigned to each program. See Chapter 5, Assigning Stations to Programs.
Problem	The actual watering time is different from the time programmed
Solution	View the LOG screen View the STATUS screen View the STATUS DETAILS screen

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Solution	The water budget feature is active. Check the ADJUST screen to view water budget settings for each program. See Chapter 6, Setting a Water Adjustment Percentage.
Problem	The controller seems to be "stuck" in the middle of a program
Solution	View the LOG screen View the STATUS screen View the STATUS DETAILS screen Try one of the following solutions: The controller is waiting for a soak period to elapse. Use of the Cycle+Soak™ feature may cause the controller to appear to be "stuck" during program operation. Check the cycle and soak values for each station on the STATION SETUP screen. See Chapter 4, Setting Cycle+Soak™ Times. The controller is waiting for a delay between master valves or a delay between stations. Use of the delay feature may cause the controller to appear to be "stuck" during program operation. Check the values of the **Delay Between MVs** and **Delay Between Stations** fields on the SETUP screen. Watering has been interrupted or canceled by a sensor. Check the LOG screen for records of sensor activity. Check the SENSOR STATUS screen to view current sensor status and inhibit conditions.
Problem	A sensor is not working or is not interrupting irrigation
Solution	View the SENSOR STATUS screen. Try the following solutions. The sensor is not connected to an active sensor input. The IM Controller is sold in a standard configuration with inputs for three switched sensors, but with

Solution	connectors for twelve sensors. To connect sensors to terminals 4-12, you must add one new sensor card to the controller for each set of three terminals. See Chapter 9, Adding Sensor Inputs.
	The sensor input has not been configured and is not recognized by the controller. When a sensor card is added to the controller, you must configure the controller on the SETUP screen to recognize the new sensor inputs. See Chapter 9, Adding Sensor Inputs.
	The sensor is not connected correctly. See Chapter 1, Connections to Optional Sensors and Chapter 9, Adding Sensor Inputs.
	The sensor has not been set up. See Chapter 4, Setting Up Sensors.
	The sensor has not been associated with stations. See Chapter 4, Associating Stations and Sensors.
	The sensor is defective. Contact the sensor manufacturer for assistance.
Problem	**The controller is running only one station at a time**
Solution	Try one of the following solutions:
	The **Max Irrigation Stations** value is set to **1.** You must change this setting to allow the controller to operate multiple stations simultaneously. See Chapter 3, Setting Program Controls.
	The controller cannot run more than one station without exceeding the controller's **Max Water Flow Rate** setting. Compare the **Max Water Flow Rate** setting on the SETUP screen to each station's estimated and measured flow values on the STATION SETUP screen to determine which stations are allowed to operate simultaneously. See Chapter 3, Setting Program Controls; Chapter 4, Setting Estimated Water Flow; Chapter 4, Viewing Measured Water Flow.

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Troubleshooting, continued

Problem	The display is blank, partial or displays something which is not readable
Solution	Try one of the following solutions: If the display has been inactive for more than 10 minutes it will turn itself off. Press any key to activate the display. The contrast setting is incorrect. Change the contrast setting on the SETUP screen. See Chapter 3, Setting the Screen Contrast. A surge caused the display to scramble. Turn the controller power switch on the transformer to the "off" position and let the controller sit for about five minutes. Turn the switch back "on". If there has been no permanent damage, the controller will operate normally. The display has failed. If the display is not completely blank, run an LCD test. See Chapter 7, Running the Hardware Tests.
Problem	The controller is not recognizing the stations I just installed
Solution	You must configure the controller on the SETUP screen to recognize the new station relays. See Chapter 9, Adding Stations.
Problem	The controller is not recognizing the sensor card I just installed
Solution	You must configure the controller on the SETUP screen to recognize the new sensor card. See Chapter 9, Adding Sensor Inputs.
Problem	I can't set the inhibit condition for a pulse sensor on the SENSOR SETUP screen
Solution	To set the inhibit condition for a pulse sensor, you must first enter information about the sensor on the SENSOR DETAILS screen. See Chapter 4, Setting Calibration for Pulse Sensors.

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Troubleshooting, continued

Problem	I need to run each station for a few minutes to test my system
Solution	Use the test program to run each station for a selected length of time. See Chapter 7, Testing All Stations.
Problem	I need to reset my controller
Solution	Warning! Resetting the controller will erase all programming and setup information and will cause the controller to revert to its default setting of twelve stations and three sensors installed. See Resetting the Controller for complete information. Turn the controller power switch on the transformer to the "off" position. Press and hold the **2** and **3** buttons on the keypad. Turn the controller power switch "on". Continue holding the **2** and **3** buttons until the main menu appears on the display. The date should read 01/01/2001.

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Appendix

Sensor Chart

Switch Sensor

Use characteristic	*Description*
Press	pressure (switch)
Freeze	freeze (switch)
Depth	depth (switch)
Light	light (switch)
Moist	soil moisture (switch)
Motion	motion (switch)
Temp	temperature (switch)
Rain	measured rainfall (pulse or switch)
Generic	generic (pulse or switch)
—	not in use

Pulse Sensor

Use characteristic	*Description*
Rain	measured rainfall (pulse or switch)
Generic	generic (pulse or switch)
ET	evapotranspiration (pulse)
Flow MV1	water flow meter associated with Master Valve 1 (pulse)
Flow MV2	water flow meter associated with Master Valve 2 (pulse)
Flow MV3	water flow meter associated with Master Valve 3 (pulse)
Wind	wind speed (pulse)
Flow	flow meter not associated with master valves (pulse)
—	not in use

Appendix, *continued*

Scheduling Charts

Blank scheduling charts are provided for the following scheduling tasks: setting up stations, setting up programs, and setting up sensors. Also included are a sensor and station worksheet and an ET entered values worksheet.

	Location	MV			Cycle Time	Soak Time	Est. Flow	Precip. Rate
Rain Bird IM Controller Set Up Stations Chart								
		1	**2**	**3**				
Station 1								
Station 2								
Station 3								
Station 4								
Station 5								
Station 6								
Station 7								
Station 8								
Station 9								
Station 10								
Station 11								
Station 12								
Station 13								
Station 14								
Station 15								
Station 16								
Station 17								
Station 18								
Station 19								
Station 20								
Station 21								
Station 22								
Station 23								
Station 24								

Set Up stations chart (part 1 of 2)

RAIN BIRD.

Appendix, continued

	Location	MV 1	MV 2	MV 3	Cycle Time	Soak Time	Est. Flow	Precip. Rate
Rain Bird IM Controller Set Up Stations Chart								
Station 25								
Station 26								
Station 27								
Station 28								
Station 29								
Station 30								
Station 31								
Station 32								
Station 33								
Station 34								
Station 35								
Station 36								
Station 37								
Station 38								
Station 39								
Station 40								
Station 41								
Station 42								
Station 43								
Station 44								
Station 45								
Station 46								
Station 47								
Station 48								

Set Up stations chart (part 2 of 2)

Rain Bird IM Controller Set Up Programs Chart							
	Program A	**Program B**	**Program C**	**Program D**	**Program E**	**Program F**	**Program G**
Description							
Type (Irr, Drip, Non)							
By (Time, Vol, ET)							
Water Window (Yes/No)							
Water Days (14 day, Odd, Even, Cycle)							
Start Times (Std, Loop)							
Rain Delay (Yes/No)							
Water Budget (%)							
Start 1							
Start 2							
Start 3							
Start 4							
Start 5							
Start 6							
Start 7							
Start 8							

Set Up programs chart (part 1 of 3)

Appendix, continued

Station Run Times	Program A	Program B	Program C	Program D	Program E	Program F	Program G
Station 1							
Station 2							
Station 3							
Station 4							
Station 5							
Station 6							
Station 7							
Station 8							
Station 9							
Station 10							
Station 11							
Station 12							
Station 13							
Station 14							
Station 15							
Station 16							
Station 17							
Station 18							
Station 19							
Station 20							
Station 21							
Station 22							
Station 23							
Station 24							

Set Up programs chart (part 2 of 3)

Appendix, continued

Station Run Times	Program A	Program B	Program C	Program D	Program E	Program F	Program G
Station 25							
Station 26							
Station 27							
Station 28							
Station 29							
Station 30							
Station 31							
Station 32							
Station 33							
Station 34							
Station 35							
Station 36							
Station 37							
Station 38							
Station 39							
Station 40							
Station 41							
Station 42							
Station 43							
Station 44							
Station 45							
Station 46							
Station 47							
Station 48							

Set Up programs chart (part 3 of 3)

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Appendix, continued

Rain Bird IM Controller Set Up Sensors Chart							
			Inhibit			**Pulse Sensor**	
Sensor #	**Type**	**Use**	**When**	**Limit**	**Volume**	**K**	**Offset**
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

Set Up sensors chart

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Appendix, continued

Station	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7	Sensor 8	Sensor 9	Sensor 10	Sensor 11	Sensor 12
Rain Bird IM Controller Sensor and Station Worksheet												
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
18												
20												
21												
22												
23												
24												

Sensor and station worksheet (part 1 of 2)

RAIN BIRD

Appendix, continued

Station	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7	Sensor 8	Sensor 9	Sensor 10	Sensor 11	Sensor 12
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												
40												
41												
42												
43												
44												
45												
46												
47												
48												

Sensor and station worksheet (part 2 of 2)

Appendix, continued

Rain Bird IM Controller ET Entered Values Worksheet	
January	_____
February	_____
March	_____
April	_____
May	_____
June	_____
July	_____
August	_____
September	_____
October	_____
November	_____
December	_____
Total	_____

ET entered values worksheet

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Appendix, continued

FCC and DOC Information

Both the U.S. Federal Communications Commission (FCC) and the Canadian Department of Communication (DOC) require certain notifications to the user of any digital device which can radiate radio frequency energy. This chapter contains the notices required by the FCC and DOC pertaining to your Rain Bird equipment.

FCC rules Part 15

This equipment is covered by FCC rules for a Class A computing device. As required by FCC regulations, the following is provided for the information and guidance of the user.

Warning! This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates, uses and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it can cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

Determine if the equipment does cause interference to radio or television, by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

1. Where it can be done safely, reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by Rain Bird Sales, Inc., could void the user's authority to operate the equipment.

DOC Compliance Notice

The Canadian Department of Communications requires the following information to be provided in this manual.

Notice: This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Réglement sur le brouillage radioélectrique édicté par le ministére des Communication du Canada.

Equipment tested and found to be compliant with FCC Part 15, as a Class A digital device, will be accepted as being compliant with the Canadian DOC standard.

Glossary

controller
a device that sends a 24 VAC power signal to the field solenoid valves.

coverplate
the portion of the controller inside the door and covering the internal wiring.

CPU
the central processing unit inside the controller.

Cycle + Soak™
a feature that breaks watering time into intervals to conserve water and prevent erosion.

default settings
the start-up settings for the controller.

evapotranspiration (ET)
the process of water being used by plant material and evaporating from the soil surface simultaneously. Evapotranspiration may be used as a basis for calculating watering amounts and times.

flow monitor
a monitoring of actual water usage through the irrigation system.

grouped station programming
a type of programming that limits you to seven programs, but allows any number of stations within those seven programs.

hint lines
short phrases that appear at the bottom of the LCD providing instructions or helpful tips about the portion of the interface you are working with.

independent station programming
a type of programming in which you create a separate program for each station.

liquid crystal display (LCD)
the illuminated display on the faceplate of the controller.

Glossary, continued

looping program

a way of programming that allows you to set one start time, one stop time, and a pause time. A looping program runs, pauses, then runs again, repeating this cycle until its stop time.

master valve (MV)

an electrically operated valve located on a system's main line that controls the flow of water to all other electric and manual valves downstream.

master valve circuit

an electrical circuit located on many controllers used to control a master valve. The master valve circuit produces voltage to control the master valve when any associated station is activated. When all of the stations on the controller are off, the master valve circuit turns off unless specifically programmed to stay on.

no watering day

a day when watering is allowed, but no watering is scheduled to occur. Unfinished irrigation from a previous day may carry over into a no watering day.

omit watering day

a day when no watering is allowed. An omit day will override a scheduled watering day.

operating mode

a designation that indicates whether the controller is running automatically, paused, in rain delay, or off.

program method

either grouped or independent programming.

program

a single station or group of stations operating with the same scheduling parameters. All stations in a given program operate using the same day cycle, start times and water budget.

program type

a designation that indicates what the constraints are on the program. Possible program types are: Off, Irrigation, Drip, and Non-irrigation.

rain delay

a feature that allows you to delay program execution for a specified number of days.

sensor

an addition to the controller that disables watering based upon information gathered at the sensor site.

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Glossary, continued

soft button

buttons on the faceplate of the controller that change function depending upon the screen displayed.

standard program

a way of programming that allows you to set separate start times for each program.

valve

a manually, electrically, or hydraulically operated device used to control flow of water in an irrigation system.

water budget

a feature allowing adjustment of water application times without reprogramming.

water window

a user-specified time during which watering is permitted. Watering is not permitted outside the water window.

watering day

a day when watering is scheduled to occur.

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Service Information

In the unlikely event that this equipment should malfunction, all repairs should be performed by an authorized Rain Bird Service Center.

For information on authorized Service Centers, contact Rain Bird at:

Rain Bird Corporation
Turf Products
6991 East Southpoint Road
Tucson, AZ 85706
Phone: (520) 741-6100
Fax: (520) 741-6522

Rain Bird International, Inc.
145 North Grand Avenue
Glendora, CA 91741
Phone: (626) 963-9311
Fax: (626) 963-4287

Rain Bird Specification Hotline
1-800-458-3005

Rain Bird Technical Services
800-247-3782 (U.S. only)

www.rainbird.com

DECLARATION OF CONFORMITY

Application of Council Directives:	89/336/EEC 73/23/EEC
Standards To Which Conformity Is Declared	EN55022 Class B, AS/NZS3548 EN61000-3-2 EN61000-3-3 EN50082-1: 1998 　EN61000-4-2　　EN61000-4-5 　EN61000-4-3　　EN61000-4-6 　ENV50204　　　EN61000-4-8 　EN61000-4-4　　EN61000-4-11 EN 60335-1: 1995 Safety of household and similar electrical appliances
Manufacturer:	Rain Bird Corporation - Controls Mfg. Division – USA 7590 Britannia Court,San Diego, CA 92154 (619) 661-4400
Importers:	Rain Bird Europe, S.A.R.L. - France BP72000 13792 Aix-en-Provence Cedex 3 (33) 442 24 44 61 Rain Bird Australia Pty Ltd. ACN 004 644 446 P.O Box 11 Harrisville Qld. 4307
Equipment Description:	Irrigation Controller
Equipment Class:	Generic-Res, Comm, L.I.
Model Number:	IM– XX　(XX = 12,16,20,24,28,32,36,40,44,48)

I the undersigned, hereby declare that the equipment specified above, conforms to the above Directive(s) and Standard(s).

	Tijuana B.C., México
Place	
Signature	**John Rafael Zwick**
Full Name	**General Manager**
Position	

Warranty

This product is covered by Rain Bird's Three-year Professional Customer Satisfaction Policy. For details, see the Rain Bird Landscape Irrigation Products Catalog.

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