



# RAIN PRO

*modular controller*

*3 to 12 Station Capability with 3 Station Modules*

*Installation and Programming Guide*

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### **MOUNTING THE RAIN PRO CONTROLLER (Indoor Installation)**

1. Locate controller within 5 ft. of a standard electrical outlet that provides continuous, uninterrupted power. Do not install controller within 15 ft. of a pump, pump start relay or any high voltage junction boxes or electric motors.
2. Choose desired location and install one screw for top keyhole into wall. Use screw anchors if attaching to drywall or masonry.
3. Hang controller on this screw. Mark wall for 2 remaining screw holes and install screws accordingly to secure controller to wall. Use screw anchors if attaching to drywall or masonry. Do not over tighten.

### **MOUNTING THE RAIN PRO CONTROLLER (Outdoor Installation)**

1. Select desired location that is at least 15 feet away from a pump, pump start relay or any high voltage junction boxes or electric motors.
2. Choose desired location and install one screw for top keyhole into wall. Use screw anchors if attaching to drywall or masonry.
3. Hang controller on this screw. Mark wall for 2 remaining screw holes and install screws accordingly to secure controller to wall. Use screw anchors if attaching to drywall or masonry. Do not over tighten.

**NOTE:** The controller should be hard wired to the transformer by a qualified electrical technician. Use an approved GFI device and use proper grounding techniques utilizing the green wire lead from the transformer. Install as per all local codes. This will help assure safety as well as the performance and reliability of the controller.

### **CONNECTING POWER SOURCE**

1. Leave electrical power unattached until all valve wires and modules are installed to controller.
2. When attaching power, transformer must be connected utilizing wire nuts and/or conduit or other locally approved connections per local code.
3. Enclosed power lead may be used when connecting to a standard electrical outlet. Connect green to green, white to white and black to black.

### **CONNECTING VALVE WIRES TO CONTROLLER**

1. Connect wire from each valve to the desired corresponding number on the terminal. Route all valve wires through the large hole in bottom right of controller.
2. Connect the remaining valve wire from all the valves to the "com" or common terminal. It is suggested to use a different color wire for the common wire to help keep organized. "Common" wires may be bundled or wired together with all other common wires from the valves to the "Com" terminal of the controller.
3. Wire sizing should be of significant size to allow a maximum of 5 volts drop between controller and valves. Use Ohms' Law to calculate wire voltage drop.

**NOTE:** All in-field wire splices should be made using a waterproof, gel-filled Hit Products DBC-Y type connector or equivalent.

### **MASTER VALVE/PUMP START WIRING**

If a master valve or pump start relay is being used in conjunction with this controller, wire as follows.

1. Route the 2 wires from the master valve or pump start relay up through the bottom right side large hole. Connect one wire to the "P/MV" terminal and one to the "Com" terminal.
2. If using a pump start relay, it must be;
  - A. Located at least 15 feet from controller
  - B. Have a maximum rated inrush current less than 350MA at 24 VAC.
  - C. Properly sized for your application

Hit Products offers a wide range of pump start relays for most applications that are compatible with the Rain Pro controller.

**NOTE:** DO NOT connect controller directly to pump. Controller will be damaged if controller is connected directly to pump.

## **INSTALLING STATION MODULES**

The Rain Pro controller is shipped from the factory with one 3-station module installed. This is supplied for valve stations #1 through #3. Additional modules can be purchased separately and are easily installed to increase the individual station capacity of the controller up to 12 stations maximum in 3 station increments.

1. Disconnect the AC power and the 9V DC battery to the controller prior to installing module.
2. Insert additional module(s) in the terminal strip area of the controller as needed. Slide each module from right to left. Firmly slide module in until it clicks in place. Each module adds 3 stations of additional capacity to the controller. Install modules in sequence from bottom to top leaving no gaps.
3. Re-connect AC power to the controller. This process will notify the controller of its increased station capacity and will activate the software accordingly. Re-install 9 V DC battery. See next section.

## **CONNECT A 9 V DC BATTERY TO ACTIVATE REMOTE PROGRAMMING WITHOUT AC POWER – OPTIONAL**

By installing a 9 V DC battery on back of controller faceplate, controller faceplate can be removed from housing and can be programmed without being attached to controller or any AC power source. AC power is required before any valve activation will commence.

## **SENSOR WIRING**

A rain sensor or any other type of normally closed micro-switch sensor may be used in conjunction with this controller. Sensor activation will interrupt controller output.

1. Route the 2 wires from the sensor through the bottom of the controller and connect one each wire to the two "SEN" terminals. Remove jumper wire between these terminals if one exists.
2. The "RAIN SENSOR" switch on the front of the faceplate can override the sensor if in the "OFF" position.

**NOTE:** If the "Rain Sensor" switch on the front of the faceplate is in the "ON" position and no sensor is connected (and the jumper wire between the "SEN" terminals has been removed), the display will show "SEN OFF" and no irrigation will occur. To override the problem when no sensor is connected-always leave the "Rain Sensor" switch on the front panel in the "OFF" position.

### **DEFAULT PROGRAM**

The controller has no default program after a power outage. The controller has a non-volatile memory and will retain your custom program.

### **PROGRAMMING THE CONTROLLER**

To successfully program controller, all three programming elements must be completed. They are:

Program Start Times (Time of day a complete programmed irrigation cycle will start)

Station Run Times (The length of time each station/valve will irrigate)

Calendar/Schedule (The days of week/calendar that you desire to irrigate)

To program the controller, you are provided + or - buttons that will change the value of the "flashing display". The ? or ? change the subject of information that is flashing. The subject or "flashing display" is in sequence and can be scrolled forward ? or ? backward to access all desired programming options.

### **BASIC PROGRAMMING FEATURES**

1. Three independent programs are available "A", "B" and "C".
2. Four program start times are available per program
3. Calendar/schedule, days of week, ODD/EVEN or individual interval scheduling options.
4. Individual station run times.

### **INPUT THE CURRENT DATE AND TIME**

1. Turn the dial to the CURRENT DATE/TIME.
2. Use the + and - buttons to select the current year. Push the ? button to activate the month.
3. The month will be flashing. Use the + and - buttons to select the current month. Press the ? button to set the day.
4. The day will be flashing. Use the + and - buttons to select the current date. Push the ? button to set current time.
5. The time will be displayed. Use the + and - buttons to select the current AM, PM or 24 hr notation. Press the ? button to go to hours. Hours will be flashing. Use the + and - buttons to set the current hour. Push the ? button to set minutes.  
Use the + and - buttons to select the current time in minutes.
6. Rotate dial to "RUN" to enter new data into controller.

### **SETTING PROGRAM START TIMES**

1. Rotate the dial to program "START TIMES".
2. Choose program A, B or C. To change program from existing program, push the PRG button.
3. Use the + and - buttons to adjust to desired start time. This represents the time of day the irrigation cycle will commence. All stations with programmed run time on this program (A, B or C) will come on, one at a time, sequentially on all active days, commencing at this time of day. Up to four start times can be scheduled per day.
4. Push the ? button to add another start time or the PRG button to set the next program.
5. If all 4 programmed start times are turned "OFF" then that specific program will never start.
6. To eliminate a start time, set dial to "START TIMES". Use the + button to scroll to 12:00 am/midnight. Then push the + button once to attain the "OFF" display.
6. Rotate dial to "RUN" to enter new data into controller.

### **ESTABLISHING INDIVIDUAL STATION RUN TIMES**

This is the setting for establishing how long each independent "valve" or "station" will be on to irrigate. Each station will come on in numeric sequence for this duration as set for each Station Run Time.

1. Rotate dial to the "Station Run Times" position.
2. Choose program A, B or C. To change program from existing program, push the PRG button.
3. Press the + or - button to increase or decrease the length of time you desire this specific station (valve) to be "ON" each time this valve is activated on this specific program.
4. Press the ? button to go to the next station
5. Repeat steps 3 and 4 for each station that is to be active on each specific program. For stations/valves that are to be inactive on a specific program, put "Station Run Time" at "0".
6. Each individual "Station Run Times" can range from 1 minute to 6 hours in duration.
7. Rotate dial to "RUN" to enter new data into controller

### SETTING WATERING SCHEDULE/CALENDAR OF "ON" DAYS

1. Rotate the dial to "Calendar/Schedule".
2. Choose program A, B or C. To change program from existing program, push the PRG button.
3. The controller has 4 active day schedule options: specific days of the week, interval watering (every 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> day), ODD or EVEN days of the month. Only one of these schedule options are available simultaneously for each independent program. Each independent program can utilize different/same schedule option.

### UTILIZING THE "SPECIFIC DAYS OF THE WEEK" TO IRRIGATE

1. Choose program A, B or C. To change program from existing program, push the PRG button.
2. Using the + and - buttons will make a day either active or inactive. "+" indicates an active day or **non-circled**. Press the "-" button to change to a **circled day**, which indicates an inactive day. The days of the week will automatically advance.
3. Repeat step 2 for each day of the week. The ? button may be used to advance to a particular day of the week.
4. After programming days of the week as desired, rotate dial to "RUN" to enter this new data into controller.

### UTILIZING THE "INTERVAL DAY" SCHEDULE

Interval Day allows you to choose to irrigate at an interval ranging from every day (1), every second day (2), up to every 31<sup>st</sup> day (31). "Days left" indicates the number of days remaining until the next scheduled irrigation cycle will occur for that specific program. As an example, if 2 is the "Interval" and 1 is the "Days Left", irrigation will occur tomorrow.

1. Push the ? button when the cursor is on Sunday. This will change the program to an "Interval Day" schedule.
2. Push the + button to increment the "Interval" indicating the desired number of days from 2 - 31 days between irrigation cycles.
3. Next, push the ? button and the number of "Days Left" will flash. Use the + or - buttons to choose the number of days until you desire this irrigation cycle to start. Number of "Days Left" will not exceed the "Interval" schedule selected.
4. Rotate dial to "Run" to enter this data in controller.

#### **UTILIZING "ODD OR EVEN" DAY SCHEDULING**

"Odd" or "Even" day scheduling is typically used to comply with regulatory watering rules. ODD/EVEN scheduling allows you to irrigate on only "ODD" numbered or "EVEN" numbered days of the month.

1. Follow the "Interval Day" watering schedule instructions above utilizing steps 1 and 2 and set the "Interval Day" to 1.
2. Push the ? button to highlight option **not** desired ODD or EVEN.
3. Push the - button to eliminate either the ODD or EVEN schedule as a "No Water Days". A circle will appear above the eliminated choice. If EVEN is selected as "No Water Days" only ODD numbered days will irrigate. Select ODD as a "No Water Days" and only Even numbered Days will irrigate.

NOTE: If ODD days are active days, February 29 and the 31<sup>st</sup> of any month will not irrigate.

4. Rotate dial to "Run" to enter data in controller.

#### **UTILIZING THE "NO WATER DAY" OPTION**

(Only for overriding the ODD/EVEN or Interval schedule for a specific day or days of the week when you regularly desire no irrigation to take place for maintenance or other reasons.)

1. Rotate dial to Calendar/Schedule
2. Press the ? button until the cursor is on "Sunday". This will change the program to "Interval Day" schedule.
3. Push the ? button and the "Interval" will flash.
4. Push the ? button again and the days of the week "Mon" will flash.
5. Press the ? button until the day you desire as a "No Water Day" is flashing.
6. Press the - button to designate this day as a "No Water Day". This specific day will now be circled.
7. Repeat steps 6 and 7 for all desired "No Water Days" on a weekly calendar.
8. Rotate dial to "RUN" to enter data in controller.

### **DIAL POSITIONS AND FUNCTIONS**

**"RUN"** - Rotate the dial to the "RUN" position after completing any programming to enter this new data in controller. Leave the dial in the RUN position to have the controller operate as programmed.

**RAIN/OFF** - Rotate the dial to the "RAIN/OFF" position to stop all output of the controller. All irrigation will stop. To return to normal operation, rotate dial back to "RUN".

**MANUAL STATION** - To manually activate a single station once for a programmed length of time.

1. Rotate dial to "Manual Station".
2. Push ? to desired station number.
3. Push + or - buttons to input length of time this station will now operate this one time.
4. Rotate dial to "RUN" position.
5. Upon completion of this station operating manually for length of time input, controller will revert back to "RUN" and operate as previously programmed.

### **MANUAL PROGRAM**

To manually activate one complete cycle of either program "A", "B" or "C":

1. Rotate dial to "Manual Program".
2. Choose program A, B or C. To change program from existing program, push the PRG button.
3. Push the ? button to choose the first station in the sequence of the manual program to start.
4. The "run time" for each station will be displayed as currently programmed. **For this cycle only**, you can customize each station run time without effecting the individually programmed station run times within a program.
5. Push the ? button to sequence through all the stations, using the + or - buttons to select the desired run times for this cycle only.
6. Push the ? button until the station number appears of which you want to start this custom cycle.
7. Rotate dial to "RUN" to start this custom, one-time cycle. It will start with station number displayed in Step
7. Once completed, controller will revert to programmed "automatic" operation.

## **"QUIK STEP" MANUAL START/ADVANCE OR REVIEW WITHOUT USING THE DIAL**

1. Push the ? button continuously for 2 seconds.
2. Program "A" values will be displayed.
3. Push the ? or ? to view the different stations and their programmed run times. Individual station run times may be adjusted using the + or - buttons.
4. Push the ? button to desired station to commence cycle. Station will start in 2 seconds and then sequence through all remaining stations.
5. This will allow for a "Quik Review" of programmed station run times by program and/or a "Quik Review" of system for inspection/performance purposes.

## **WATER BUDGET**

The water budget feature provides a one step universal station run time adjustment in 10% increments up or down. It effects all station run times in all programs. In hotter, drier weather, you can increase the water budget in 10% increments to 150% of originally programmed station run times. In periods of cooler/wetter weather, you can water budget downwards-in 10% increments to as low as 10% of originally programmed station run time.

1. With dial in any position, press up arrow to increase water budget or down arrow to decrease water budget.
2. The actual individual station run times as effected by the current water budget setting can be viewed by rotating the dial to "Station Run Times".
3. To check the current water budget level setting or to get to 100% (original setting/base setting). Rotate the dial to the "RUN" position. Press either the up or down arrow. The current setting will be displayed.

## **BONUS FEATURES**

### **Activate or De-activate Master Valve/Pump Start by station:**

1. Rotate dial to Pump/Master Valve ON/OFF. "ON" will be highlighted.
2. Push the - button to change from ON to OFF.
3. Push the ? button to select the station.
4. Rotate dial to the "RUN" position.

## **PROGRAMMABLE PAUSE BETWEEN STATIONS**

1. Rotate dial to "RUN" position.
2. While depressing the - button, simultaneously rotate dial to "Station Run Times" position.
3. Leave dial in this position, remove finger from - button. Delay time will be flashing.
4. Push the + or - buttons to select the desired delay time between each station operation. Range of programmable delay is 1 second to 4:00 (four hours and zero minutes).
5. Rotate dial back to the "RUN" position to enter this new data in controller.

## **RE-SETTING OR ERASING CONTROLLER MEMORY**

If you want to eliminate all past data input to controller, as if to start over as new, with no data in controller, proceed as follows:

1. Press the ? , the - button and the PRG buttons simultaneously. While holding all three buttons down, on the back of the front panel also simultaneously press the RESET button.
2. Release only the reset button.
3. Then release the ? , - and the PRG buttons simultaneously.
4. Controller will now display 12:00 a.m. and all the entered data has been erased. The controller can now be programmed as if brand new.

TROUBLE SHOOTING GUIDE

<u>Problem</u>	<b>Cause / Correction</b>
<b>No Display Information</b>	Check AC Power Supply, power after transformer should be 24-26 vac Check AC Wiring Check Fuse or circuit breaker
Display Reads "No AC"	Check AC Power Check AC Wiring
<b>Display Reads "ERR"</b>	Master Module not installed properly Turn off AC Power & Restart after 30 seconds See Remote Control Wiring Instructions
Display Reads "P ERR"	Check for "short" or bad wire connections in the pump start or Master Valve wiring or solenoid wiring
Display Reads Station "ERR"	Check for short or bad wire connections in that station's field wiring or solenoid wiring
Display reads "Sensor off"	Slide Rain Sensor switch to "off" or install a sensor jumper wire on terminal strip.
Controller Recognizes incorrect number of Stations	With AC power connected, Reset controller – refer to the re-setting or Erasing The Controller Memory section in instruction booklet.
Controller is irrigating at incorrect times	Check Programming, Day, Time, AM-PM Start Times and Active Day settings