

MC^{plus} SERIES A CONTROLLERS



OWNER'S MANUAL

4, 6, 8, 12, 18, 24, 30, 36 and 42 stations





Thank you for purchasing the Irri-Trol MC*plus* Series Controller. Listed below are some important features you should be aware of before you begin programming. Details on how to implement these features are described on the following pages.

Programmable Watering Calendar from 1 to 16 days for application versatility

Sensor feature in program 4 for water conservation systems

Programmable Delay between stations to prevent pressure loss

Rechargeable Battery Back-up System to maintain “real time” and programmed information in the event of a power failure

Four independent programs for system versatility

Capability of operating up to 4 valves per station (MC-8*plus* through MC-42*plus*)

Water Budgeting for simple, single-entry increase or decrease of watering time per program

Total Watering Time display for quick review of scheduled watering time per program

True Manual, Semi-automatic and/or Single Station Timed Manual for versatile operation

Incomplete Program Alert to prevent errors in programming

Two-minute Test for easy system testing

RF Ready for upgrading to an Irri-Trol Remote Control System

Scrolling Program for information recall

Selectable Single Program option for winter/summer programs

Watering Times in seconds, minutes or hours

-- Selectable Loop option for continuous cycling of program

Single Entry All Stations On Time for ease of programming (30-, 36-, and 42-station models)

These are just a few of the many features of the MC*plus* Series Controllers. Please review your manual before beginning programming.

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MC*plus* SERIES CONTROLLERS

- 1 110/24 volt transformer
- 2 Terminal Strip-for 24v, sensor, common, master valve and individual station hook-ups
- 3 Set Time Key-to enter the current time of day and start the digital clock
- 4 Manual On/Off Key-for manual and semi-automatic operations
- 5 Station indication LEDs
- 6 PE/Calendar position-to select programs to be erased and/or to select and display Watering Calendar
- 7 Rain Off /2 Min. Test position-to select the Rain Off mode and/or the Two-minute Test
- 8 Manual position-for true manual operation
- 9 Auto/Run position-to lock keyboard when not programming
- 10 Circuit Breaker-will reset when controller is overloaded to prevent damage to the controller; 24 VAC, 2.0 amps
- 11 Program positions 1 through 4-to select desired program
- 12 Number Keys 0 through 9-for programming applications
- 13 Digital Display-for viewing current time and programmed information
- 14 Enter Key-enters Water Time and Cycle Start functions
- 15 Water Time Key-for individual programming and/or recall of station Watering Times
- 16 Cycle Start Key-for programming and/or recall of Cycle Start Times
- 17 Day Off Key-for scheduling and/or recalling non-watering days
- 18 Day On Key-for scheduling and/or recalling watering days
- 19 Clear Key-for clearing entries from the display
- 20 PM/% Key-for setting a time function in the p.m. period and/or for selecting the Water Budgeting feature
- 21 Set Today Key-for setting the current day of the week
- 22 RF Connector-for hook-up of an Irri-Trol Remote Valve Control
- 23 Option Switches-for selecting additional features (see page 13)
- 24 Rechargeable Battery Back-up Case and Connector
- 25 Lower Face Plate



MC-12 plus

IRRI-TROL
VALENCIA, CALIFORNIA

MC-12 plus QUICK REFERENCE PROGRAMMING GUIDE:
Please read the entire Programming Guide prior to start of programming.

CAUTION
Use 4 (RECHARGEABLE) size AA NiCAD batteries. Use of other type will damage controller.

OPTION OFF ON

1	MINUTES / HOURS	RUN ALL PROGRAMS	RUN SINGLE PROGRAM
2	MINUTES / HOURS	AS.P.P. YES	AS.P.P. NO

NOTE: ALL OPTIONS SET TO "OFF" BY FACTORY.

IRRI-TROL
VALENCIA, CALIFORNIA

779-2
WATERING CONTROLLER FOR OUTDOOR USE
INPUT 12VDC, 500mA
OUTPUT 24VDC, 500mA

Serial No. _____

1 WATERING TIMES (MINUTES) TO BE SUBSTITUTED IN ENTRY PROGRAMS

2 STATION ZONE DESCRIPTION

3 STATION 1

4 STATION 2

5 STATION 3

6 STATION 4

7 STATION 5

8 STATION 6

9 STATION 7

10 STATION 8

11 STATION 9

12 STATION 10

13 STATION 11

14 STATION 12

15 STATION 13

16 STATION 14

17 STATION 15

18 STATION 16

19 STATION 17

20 STATION 18

21 STATION 19

22 STATION 20

23 STATION 21

24 STATION 22

25 STATION 23

INSTALLATION INSTRUCTIONS

MOUNTING THE CONTROLLER

The controller is in an outdoor, rain-tight, rust-resistant and dust-proof box. Nevertheless, controller **MUST** be installed away from direct sprinkler spray. It also should be placed in a shaded and dry location, if possible. **DO NOT** install in closed and humid environment, or in an area subjected to continual heavy condensation.

WALL MOUNT: For Wall Mounting, install controller vertically on flat, secure surface. Use the enclosed template to locate mounting screw holes. Follow complete mounting instructions on template.

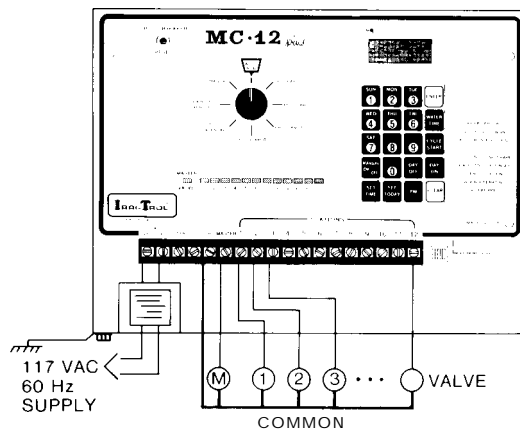
PEDESTAL: For free-standing installation on a pedestal, follow the installation instructions in the pedestal box.

CAUTION: The controller should not be placed where it is exposed to a temperature exceeding 130° F.

ELECTRICAL HOOK-UP

1. To begin, remove the lower panel by unfastening the screws located on each side. Follow the wiring diagram shown in Figure 1, Strip wires approximately 1/4" (do not bend exposed end). Insert straight bare wire between plates of "sure grip" terminal. Tighten screw firmly. Follow all applicable local electrical wiring codes,

Figure 1



IMPORTANT: Use a separate (dedicated) valve common for each controller.

Note: Make certain that the 120 VAC 60Hz supply is attached to the black and white wires of the transformer. The yellow and red wires go to the 24 VAC input on the terminals of the controller.

CAUTION: NEVER short wires in order to identify a station or to verify power from 24-volt side of transformer. This will result in damage to controller and/or transformer.

2. A maximum of **FOUR** 4-watt solenoid valves may be connected to each station. Exception: *MC-4plus* & *-6plus*, maximum of **TWO** 4-watt solenoids. A maximum of **FOUR** 4-watt solenoid valves may be programmed to operate simultaneously.

3. In cases where a pump is to be controlled by the master valve output, **DO NOT** drive the pump directly from the controller. The master station must be connected to the coil of a 24 VAC relay, such as an Essex# 184-20105-101 Z (Irri-Trol part no. I 1001). The pump latch relay should be set up by an electrician so that a switch closure will activate the latch relay coil, turning on



the pump. The switch contacts of the Essex relay should be connected to control the latch relay coil (See Figure 2). The relay should be mounted at least 5 feet from the controller box and the box *MUST* be grounded. Installation must follow all local electrical wiring codes.

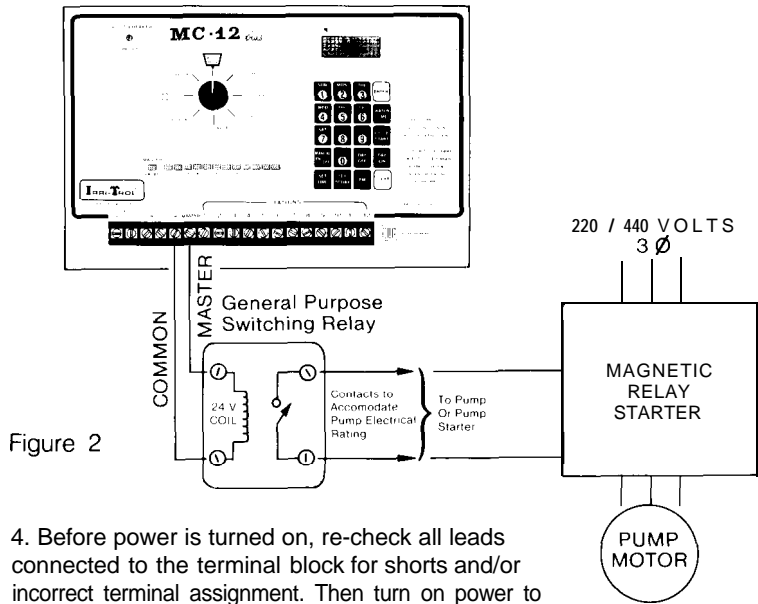


Figure 2

4. Before power is turned on, re-check all leads connected to the terminal block for shorts and/or incorrect terminal assignment. Then turn on power to controller.

5. Battery Back-up: The controller is equipped with a rechargeable battery back-up circuit in case of a temporary power failure (batteries not included). The batteries will retain real time and will hold all program information for about 4 weeks.

- a. The battery pack is located on the back of the P.C. Board. This pack is designed for 4 AA NICAD RECHARGEABLE batteries (not included).

CAUTION: Use of other types of batteries may damage controller.

- b. IT IS MANDATORY that the batteries be installed only *AFTER* power is turned on and programming has been completed.

IMPORTANT: Whenever working in the field while power is on, the common wire must be disconnected from the controller's terminal block. This will eliminate any possible 24-volt shock.

The controller is a solid-state microcomputer that may be affected by transient surges and electromagnetic interference. Care must be taken not to install controller on a circuit controlled by a switch or on the same circuit as a "high power user" (i.e. refrigerator, air conditioner or a large horsepower pump or motor). In addition, the controller must be installed at least 15 feet from a "high power user." Valve and power wires must also be routed away from "high power users."

This controller has been equipped with a floating valve common. It is not referenced to earth ground. This will not affect operation of your controller.

CONTROLLER GROUNDING TECHNIQUES

MCplus SERIES CONTROLLERS

For safety, transient protection and increased reliability, controller **MUST** be grounded.

Controller should be installed using a “three wire” 110 VAC supply with a verified third wire ground. Connect the green ground wire directly to the controller’s case. Do **NOT** wire 110 volts directly to P.C. board terminals, the transformer supplied with controller **MUST** be used.

Whenever possible, controller should be installed on its own dedicated circuit breaker. Under no circumstances should the controller be installed on the same line or within 15 feet of a heavy inductive load such as a pump, motor, air conditioner, refrigerator, etc.

In areas where lightning is prevalent or the condition of the third wire ground is questionable, a ground rod must be installed. Connect the grounding rod to the controller’s case ground using a #10 gauge or heavier stranded copper wire. The distance from the controller’s case to the earth ground should be minimized. Additional 1 IO-volt transient protection also may be necessary in areas where power frequently is disrupted.

BASIC PROGRAMMING INSTRUCTIONS

To begin programming, Program Knob must be turned to program #1, #2, #3 or #4. There are 5 required programming steps, which may be applied in any order. The sequence for pressing the keys in the following examples, however, must be followed exactly:

STEP #1

Set time: Key in current time using numeral keys (If during p.m. period, press "PM/%" Key prior to "Set Time" Key. The PM Indicator will show on the left side of the display window). Then press "Set Time" Key.

EXAMPLE A: Time is 10:25 a.m., Press:



EXAMPLE B: Time is 3:23 p.m., Press:



Note: Midnight is 12:00 a.m.; Noon is 12:00 p.m.

STEP #2

Set Today: Key in the number corresponding to the current day of the week; then press "Set Today" Key.

EXAMPLE: Today is Wednesday, press:



At this point, the Program Erase may be activated to clear all programmed information:

- a. Turn Knob to P.E./Calendar position.
- b. Press in the following key sequence: "1, 3, 7, 9."
- c. Press "Enter" Key (display will show a flashing "PE" to indicate that all programs have been erased).
- d. Return Program Knob to desired program.

IMPORTANT: The Set Time and Set Today functions automatically apply to all 4 programs and need only be entered once. The next 3 functions (Days On, Water Time and Cycle Start) apply ONLY to the program indicated by the Program Knob and must be entered in each program that is intended to operate automatically.



STEP #3 Set Days On: To program which days of the week the controller turns on, key in the number corresponding to a Day On and then press the “Day On” Key. Repeat for all selected watering days.

EXAMPLE: Selected watering days are Sunday, Tuesday and Thursday. The corresponding numbers for these days are:

Sunday=1 ; Tuesday=3; Thursday=5.

To program, press:



To delete a programmed Day On, key in the number of that day, then press the “Day Off” Key. When programming a Day On, display will show “On” and the number corresponding to the appropriate day of the week. To indicate a Day Off, display will show “Off” and the day number.

STEP #4 Set Water Time: Enter the watering duration for each station

To program Water Time:

- Key in station number.
- Press “Water Time” Key.
- Key in watering duration.
- Press “Enter” Key
- Repeat for all stations to be entered in this program.

EXAMPLE #1: To set Station 8 to water for 25 minutes, press:



EXAMPLE #2: To set Station 16 to water for 1 hour and 20 minutes, press:



Programmed stations will turn on in sequence. Controller will skip an unprogrammed station. To delete a programmed station, enter “0” for Water Time.

Note: A flashing “P” on the display indicates previous Station Placement (see glossary) has been programmed. To change Station Placement, one of the original Water Times must be set to zero.

To recall the Water Time entered for a station, key in the station number and then press the “Water Time” Key.



STEP #5

Set Cycle Start: Enter the starting time for each watering cycle on the scheduled Days On.

To program Cycle Start:

- a. Press appropriate key to indicate number of cycle (in Programs #1 and #2, this can be "1," "2" or "3" while in Programs #3 and #4, it can be either "1" or "2").
- b. Press "Cycle Start" Key.
- c. Key in time of day that cycle is to start.
- d. If Cycle Start is during p.m. period, press the "PM/%" Key.
- e. Press "Enter" Key.
- f. Follow the same procedure for each additional Cycle Start.

Note: Use only one Cycle Start if the controller is to water once a day; Cycle Start number is NOT related to station number.

EXAMPLE: Controller is to initiate a watering cycle twice a day, on the scheduled Days On. First cycle is to start at 4:15 a.m., second cycle to start at 9:45 p.m. Press:



Note: Only one watering cycle per program can be operating at any given time; there must be at least a 1 -minute break between watering cycles to prevent the controller from skipping (ignoring) the second cycle.

To delete a Cycle Start, enter "0" as the starting time of the watering cycle.

To recall the programmed starting time of a watering cycle, key in number of desired Cycle Start and then press "Cycle Start" Key (Display will show [0:00] if no Cycle Start was programmed).



Incomplete Program Alert: To check that programming has been completed:

Move Program Knob out of current program position. If programming is incomplete, controller will sound one long beep.

IMPORTANT: This beep indicates that the program will NOT run automatically.

To continue programming, turn Program Knob to next desired program and follow Steps 3 through 5 above. Repeat for all desired programs.

When programming has been completed, turn Program Knob to Auto Run position. This will lock the keyboard, thus eliminating unintentional program entries. In Auto Run position, the current time will show on the display.

MANUAL OPERATION

TRUE MANUAL OPERATION

Selected station will water until manually turned off.

- a. Turn Knob to Manual position.
- b. Key in station number.
- c. Press "Manual On/Off" Key.

To alert operator, controller will sound two quick beeps every 30 seconds while a station is manually on.

To terminate True Manual Operation do ONE of the following:

1. Press "Manual On/Off" Key; OR
2. Select another station for manual operation; OR
3. Move knob out of Manual position.

Note: *FOR SAFETY A STATION THAT WAS TURNED ON MANUALLY WILL SHUT OFF AUTOMATICALLY AT MIDNIGHT*

SEMI-AUTOMATIC

Allows manual activation of a watering cycle. Operation applies ONLY to the program designated by the Program Knob.

- a. Turn Program Knob to desired program.
- b. Key in first station intended to turn on.
- c. Press "Manual On/Off" Key. (Display will alternately flash station number and Remaining Water Time.)

All stations programmed after the selected starting station will turn on automatically in sequence.

Note: Selected starting station must have programmed Water Time in order to turn on semi-automatically or controller will select the next programmed station in sequence.

SINGLE STATION TIMED MANUAL

Manually turns on a station for the programmed Water Time without continuing to the next programmed station.

- a. Turn Program Knob to desired program.
- b. Key in station number.
- c. Press "Water Time" Key.
- d. Press "Manual On/Off" Key. (Display will alternately flash station number and Remaining Water Time.)
- e. Return Program Knob to Auto Run position.

EXAMPLE: For an additional watering of Station #1 without activating the rest of the sequence in Program #2:

Turn Program Knob to Program #2. Then press:



Note: A station without programmed Water Time will NOT turn on.

RAIN OFF/2 MIN. TEST POSITION

- a. Rain Off: Turns off all stations without affecting the program. It will not allow automatic activation of any cycle(s).

Stations currently watering will turn off after a 2-second delay. While in Rain Off position, display will read "OFF." Taking Program Knob out of Rain Off position will return controller to normal operation.

- b. Two-minute Test: Tests all stations without affecting the program.

To begin the test with Station #1, press "Manual On/Off" Key. To begin with any other station, press that station number and then the "Manual On/Off" Key.

IMPORTANT: If Program Knob remains in Rain Off /2 Min. Test position after completion of Two-minute Test, controller will automatically assume the Rain Off position

Note: When moving Program Knob from Rain Off /2 Min. Test position, there is no need to reprogram.

MANUAL OFF

Applies to Semi-automatic, Single Station Timed Manual and Two-minute Test.

To shut off a watering station: Press the "Manual On/Off" Key.

ONLY the station that is watering in the program indicated by the Program Knob will turn off. The cycle will be terminated whether it was initiated semi-automatically or automatically.

DISPLAY OF PROGRAM

Displaying information does not affect the program. To recall any of the following functions, set Program Knob to Program #1, #2, #3 or #4. Repeat for all desired programs.

SET TIME

Press "Set Time" Key and display will show the current time. (When dial is in the Auto Run position, display always will show the current time.)

SET TODAY

Press "Set Today" Key. The number shown on the display will correspond to the current day of the week.

Note: To change Set Time or Set Today, follow the directions given in Basic Programming (p. 7). Newly programmed information replaces previously programmed information.



DAYS ON Press the "Day On" Key and display will scroll the days that are programmed as days on.

DAYS OFF Press the "Day Off" Key and display will scroll the days that are programmed as days off.

WATER TIME

- To recall the Water Time programmed for a particular station, key in the station number and then press the "Water Time" Key.
- To recall Total Water Time, press "Clear" Key. Then press "Water Time" Key. Display will indicated the Total Watering Time within the program.

Note: If the number that appears on the display is flashing, the Total Watering Time is greater than 100 hours. Add 100 to the flashing number for the true Total Watering Time.

c. Scrolling of Programmed Water Time: Lists consecutively the watering time of each station beginning with the first one that is programmed.

To activate:

Press "Clear" Key. Then press "Water Time" Key once, and the display will show the Total Watering Time for the selected program. Press "Water Time" Key again, and display will alternately flash station number and watering time for each programmed station.

Note: Controller will not display stations with "0" Water Time.

**CYCLE START/
CYCLE END** To recall the starting time of a watering cycle, key in the number of the desired Cycle Start; then press "Cycle Start" Key. To recall the ending time of the same watering cycle, press "Cycle Start" Key again.

EXAMPLE: In Program #2, the first watering cycle is programmed to begin at 6:00 a.m. The total watering time of all stations within the program is 14 hours:

- Turn knob to Program #2.
- Press numeral "1" Key.
- Press "Cycle Start" Key. Display will show the starting time of 6:00 a.m.
- Press "Cycle Start" Key again. Display will show the ending time of 8:00 p.m. (PM Indicator will show in the left corner of the display window.)

A flashing end time on the display indicates that the total Watering Time of the cycle exceeds 24 hours.

EXAMPLE: If the above cycle had a Total Watering Time of 27 hours instead of 14 hours, the display would show a flashing end time (9:00 a.m.). This would indicate that the cycle does not end during the *same* 24-hour period in which it began, but rather during the *following* 24-hour period.

ADDITIONAL FEATURES

SELECTABLE AUTOMATIC SAFETY BACK-UP PROGRAM (ASBP)

At power-up, the ASBP is activated automatically in Program #1. The ASBP will be reactivated after every power failure if batteries fail or are not installed. To deactivate the ASBP: Change Option Switch #3 to the on position (up).

PROGRAMMABLE WATERING CALENDAR

The Watering Calendar may be programmed to range from 1 to 16 days. The calendar automatically is set by the factory to 7 days.

To change Programmable Watering Calendar:

- Turn dial to P.E./Calendar position. Display will indicate currently programmed calendar length. Example: [PE:7] indicates a 7-day weekly calendar.
- Press numeral key(s) corresponding to desired calendar length (1-16).
- Press "Enter" Key (the number on the display will flash to indicate that the new calendar has been accepted).

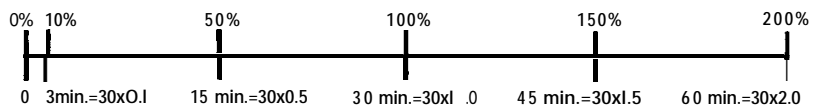
Note: The number entered for Set Today and Days On cannot be greater than selected calendar length (see pp, 7 & 8).

EXAMPLE: To water every other day, select an even number such as "2" for the Calendar Length and choose 1 Day On. To water once every five days, select "5" for the Calendar Length and choose 1 Day On and 4 Days Off

WATER BUDGETING

Changes all Water Times within a program by 1% through 255%, with 100% being the current Water Time.

The following scale shows Water Times (below the line) and the corresponding percentages (above the line) for a station originally set to water for 30 minutes:



To program Water Budgeting:

- Turn Knob to desired program.
- Press the "PM/%" Key (display will show 100%).
- Key in new percent value.
- Press "Enter" Key.

Note: The entered percent value will flash on the display to indicate that it has been accepted.



EXAMPLE A: To program controller to use only 2/3 of currently programmed Water Time for each station, multiply $(2/3) \times 100$ to get 67 (after rounding off). To decrease all of the Water Times in this program by that proportion, press:



If Station #1 had been programmed to water for 30 minutes and Station #2 had been programmed for 40 minutes, then Station #1 would have been changed to $(30 \times 0.67) = 20$ minutes (decimals are rounded off), and Station #2 would have been changed to $(40 \times 0.67) = 26$ minutes.

EXAMPLE 5: If the desired Water Time for at least one station is known, and all other stations are to be changed proportionately, the correct percent value to enter may be determined by:
 $[(\text{New Water Time}) + (\text{Current Water Time})] \times 100$. If Station #4 is programmed to water for 25 minutes, and its new desired Water Time is 35 minutes, the correct percent value to enter is $35/25 \times 100 = 140\%$.

Note: When Water Budgeting is used, the adjusted Water Times replace the previously programmed Water Times.

PROGRAMMABLE DELAY BETWEEN STATIONS

There will be an interval between one station turning off and the next station turning on in sequence. Delay may range from 1 second through 4 minutes.

To program Delay:

- Program Knob must be in a program position (important: option may be accessed in any program but will apply to ALL programs).
- Press numeral "0" Key.
- Press "Water Time" Key.
- Press numeral key corresponding to the desired delay time.

Note:

- Master Valve will stay on during Delay.
- Controller automatically will enter Delay in seconds and minutes.
- Delay Time will be deducted from previous station's Watering Time

EXAMPLE: To enter a Delay of 5 seconds, press:



To delete Delay, enter "0" as desired delay time

**SINGLE PROGRAM
OPTION**

Programs may be run separately according to Program Knob position. This option allows for seasonal pre-programming.

To use Single Program Option: Option Switch #2 must be in the on position (up). Option may be activated while controller is powered.

Cycle Start will operate on/in the program indicated by the Program Knob. If the Program Knob is in the Auto Run, Manual or P.E./Calendar position, all programs will operate concurrently.

**PROGRAM #4
OPTIONS**

The following options are available only in Program #4.

- a. Seconds Mode: Changes all stations in Program #4 to seconds and minutes, with a maximum Water Time of 24 minutes instead of 24 hours. If Loop option is being used, the last station in Program #4 will remain in minutes and hours to allow for a programmable pause between loops.

To change to Seconds Mode: Option Switch #1 must be in the on position (up). Option may be activated while controller is powered.

- b. Loop Option: Repeats sequential watering of all stations in Program #4.

To program beginning time of Loop:

1. Press numeral "2" Key.
2. Press "Cycle Start" Key.
3. Press numeral keys corresponding to desired beginning time of Loop.
4. Press "Enter" Key.

To program ending time of Loop.

1. Press numeral "0" Key.
2. Press "Cycle Start" Key.
3. Press numeral keys corresponding to desired end time of Loop
4. Press "Enter" Key.

EXAMPLE: To program a Loop beginning at 8:00 a.m. and continuing until 7:30 pm, press the following keys to set beginning time:



Now press the following keys to set the Loop's ending time:



The Loop will finish at the programmed end time regardless of whether the last cycle has been completed



Note: Loop is activated ONLY upon setting the end time. If end time is not programmed, Cycle Start #2 will function as a standard Cycle Start. Once Loop has been programmed, display will read "LOOP" when Cycle End #2 is recalled.

c. Sensor: Initiates a watering cycle in Program #4 only.

To use Sensor: Attach Sensor to terminals #3 and #4 of the controller's terminal block. Sensor should be a "normally open" type. When the Sensor contacts close, controller will initiate a watering cycle in Program #4. Sensor contacts must remain closed for 30 seconds before a cycle will be initiated.

If the Sensor remains closed after completion of watering cycle, another cycle will be initiated. If the Sensor opens before completion of watering cycle, no new cycle will be initiated. The cycle that is in progress, however, will continue watering until completion.

REMAINING WATER TIME

To determine the amount of time remaining until completion of a station's programmed Water Time: Turn Program Knob to a program with a station currently watering. Display will alternately flash the station's number and its Remaining Water Time.

EXAMPLE: Station 2 in Program #3 is programmed to water for 30 minutes at 9:00 a.m. Turning the Program Knob to Program #3 at 9:10 would show [00:20] minutes on the display, while turning the Program Knob to Program #3 at 9:25 a.m. would show [00:05] minutes on the display.

ALL STATIONS WATERING TIME

Set all stations watering time with one entry (30-, 36-and 42-station models only).

To Program All Stations Watering Time:

- a. Key in "99"
- b. Press "Water Time" Key
- c. Key in watering duration
- d. Press "Enter" Key

GLOSSARY

ASBP	Automatic Safety Back-up Program. A safety feature that automatically operates controller in case program is lost during temporary power failure because batteries failed or were not installed. When the ASBP is activated, each station in Program #1 waters for 10 minutes every day at 4:00 a.m., or 4 hours after power is restored (p. 13).
BATTERY BACK-UP	Use four 1.2 volt Nicad rechargeable batteries. Batteries will hold program in memory and keep time accurately, for up to 4 weeks, during temporary power failure.
WATERING CYCLE	The sequential watering of all stations programmed with Water Time, beginning with the first programmed station and continuing through to the last programmed station.
CYCLE START	The time of day a watering cycle will start. Programs #1 and #2 can initiate a cycle 3 times per day, while Programs #3 and #4 can do so 2 times per day; thus allowing for a total of 10 Cycle Starts per day (p. 9).
CYCLE END	The time of day a watering cycle will end (p. 12)
ERROR DISPLAY	“Error” will appear on the display and controller will sound 3 quick beeps if unacceptable information is entered. Programming cannot be continued until the “Clear” Key is pressed. Repeat correctly ONLY the last programming function.
INCOMPLETE PROGRAM ALERT	Controller alerts operator (long beep), upon moving from programming position, if one or more of the functions necessary for automatic operation (Days On, Water Time, Cycle Start) has not been entered into a program.
LOOP	All stations in Program #4 with programmed Water Time will continuously water in sequence, beginning with the first programmed station, continuing through to the last programmed station, and then beginning again with the first programmed station, etc. (p. 15).
PROGRAM ERASE (P.E.)	Erases all previously programmed information, including ASBP. Does NOT erase Current Time, Current Day or Programmable Watering Calendar (p. 7).
PROGRAMMABLE WATERING CALENDAR	Recurring watering schedule within which Days On are selected. Calendar may be programmed to range from 1 through 16 days. Calendar is set by factory to a 7-day weekly schedule (p. 13).
PROGRAMMABLE DELAY BETWEEN STATIONS	The interval between one station turning off and the next station in sequence turning on. Delay may range from 1 second through 4 minutes in 1 -second increments. Delay is set by factory to “0” seconds (p. 14).
REMAINING WATER TIME	The amount of time remaining in a station’s programmed Water Time (p. 16).



SECONDS MODE	Program #4 Water Time may be programmed in 1-second increments instead of 1-minute increments (p. 15).
SEMI-AUTOMATIC OPERATION	Manual activation of a watering cycle.
SENSOR	Initiates a watering cycle in Program #4 regardless of programmed Cycle Start or Days On (p. 16).
SINGLE PROGRAM OPTION	Only the program indicated by the Program Knob will operate automatically (P, 15).
SINGLE STATION TIMED MANUAL	Manually turns on a station for the programmed Water Time without continuing to the next programmed station (p. 10).
STATION PLACEMENT	Each station can be programmed to water in 2 programs. If a station is called in a third program, display will flash the numbers of the programs in which the station already is entered (P1:P2, for example). On the 30-, 36- and 42-station controllers, each station can be programmed in only 1 program.
STATION WATERING DURATION	In Programs #1 and #2, the maximum watering time for each station is 10 hours, in 1-minute increments. In Programs #3 and #4, the maximum watering time for each station is 24 hours, in 1 -minute increments.
TOTAL WATERING TIME	The sum of all the individual station's Water Times within the program indicated by the Program Knob (p. 12).
TRUE MANUAL OPERATION	Station will water until manually turned off or will automatically shut off at midnight (p. 10).
WATER BUDGETING	Changes all Water Times within a program by a percent value ranging from 1% through 255% in 1% increments (p. 13).