
IC 4 Controller

Owner's Manual



Sprinkler Systems

INTRODUCTION



Your TORO IC4 System leads the new generation of irrigation controllers, designed for both residential and commercial use. It will allow you to set up a watering program tailored to your needs through a built-in micro-computer incorporating the latest micro-electronics technology. The computer will remember your instructions for each watering station and execute them just as you have programmed them.

This manual will show you how to set up your controller's electronic clock, enter the automatic watering programs you need, change them whenever necessary, or operate your system manually. This instruction manual should only be used with Toro IC 4 Controllers.

Follow the instructions step-by-step at first, until you are familiar with them. Later, you may prefer to simply use the "cue sheet", conveniently located below the keyboard inside your controller case.

Open this gatefold to familiarize yourself with the controller panel layout, the components and their functions. It may be left open for easy reference, as you read through the set-up and programming instructions.



TABLE OF CONTENTS

SUBJECT	PAGE
Active Day Programming	7-8
Battery Installation	3
Battery Replacement	4
Checking Your Watering Program	13
Clock Adjustment	5
Controller Programming Steps	6
Day Code Chart	7
Electrical Specifications	19
Fuse Replacement	17
Manual System Operation	14-15
Power Connection	2
Run Time Programming	9-10
Service Assistance	19
Setup, Initial	2
Shutdown	16
Start Time Programming	11-12
Troubleshooting	17-18

CONTROLLER COMPONENTS AND FUNCTIONS

1 DISPLAY PANEL

provides information on your system status.

2 KEYBOARD

is used to program your irrigation system for automatic operation; to operate the system manually or to stop and start watering activity.



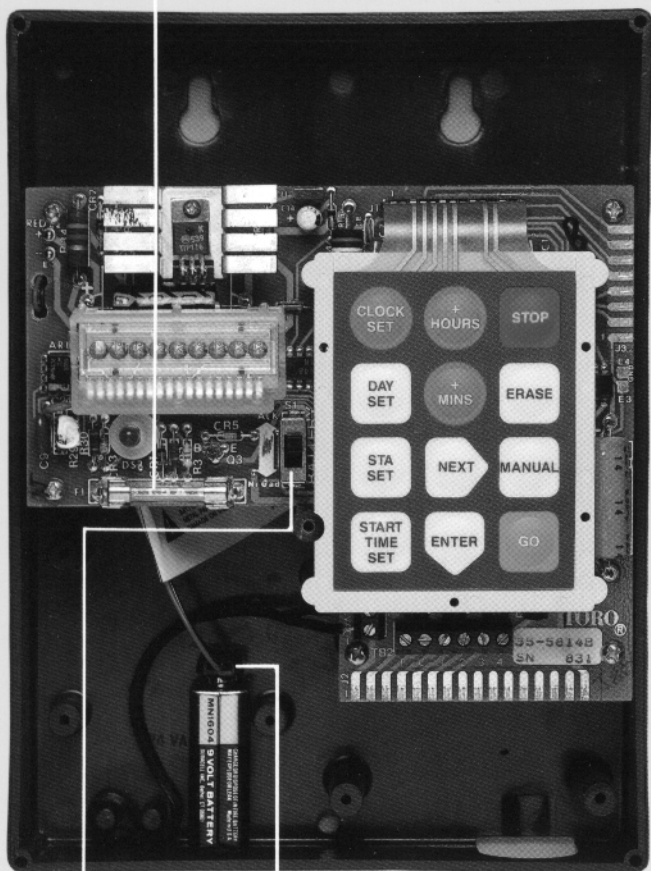
ACTIVE DAY INDICATOR

goes on to indicate days on which watering is programmed.

3 SCREW FASTENER

releases the front panel to provide access to the battery compartment and safety fuse.

6 SAFETY FUSE
(1.5 amp.)



**4 BATTERY TYPE
SELECTOR**
(Alkaline or NiCad).

**5 BATTERY
CONNECTOR**

INITIAL SETUP

1 CONNECT THE TRANSFORMER TO A 115 V.A.C. RECEPTACLE

Your IC 4 Controller is provided with an external transformer which should be connected to a 115 V.A.C., 60Hz power supply. The transformer provides 24 V.A.C. power to your controller.

THE CONTROLLER MUST NEVER BE CONNECTED WITHOUT THE TRANSFORMER.

When your controller is first connected, the readout panel will show 0100 A 01.

Before putting your IC Controller into operation, the following two steps must also be completed:

2 INSTALL BATTERY

The battery will protect your controller memory in the event of power interruption, and you will avoid the necessity for reprogramming.

Please read the BATTERY instructions (Page 3) to learn how to install and change batteries.

3 SET THE CLOCK TO THE CORRECT TIME

Please read the CLOCK instructions (Page 5) to learn how to set and adjust the clock.

Once these two items have been completed, the controller will be ready to use.

The CONTROLLER PROGRAMMING instructions, Page 6, will show you how to set up your own custom watering program.

A new battery will protect your controller memory for about two hours in the event of power interruption.

The IC Controller is designed to use either of the following nine-volt battery types:

Rechargeable Ni-Cad Battery (GE Type GC9 or equivalent) or Alkaline Battery (Mallory MN1604 or equivalent).

OTHER BATTERY TYPES MUST NOT BE USED. THIS IS EXTREMELY IMPORTANT. YOUR CONTROLLER MAY NOT FUNCTION CORRECTLY UNLESS THIS INSTRUCTION IS FOLLOWED.

TO INSTALL BATTERY:

- 1** Release SCREW FASTENER (3) and remove the faceplate.
- 2** Locate the BATTERY CONNECTOR (5). Pry off the plastic protector and connect the battery.

WARNING



EXTREME CARE MUST BE TAKEN TO PREVENT BATTERY TERMINALS TOUCHING ANY METAL PART OF THE CONTROLLER. DAMAGE OR INJURY MAY RESULT.

- 3** SET BATTERY TYPE SELECTOR

The battery type selector switch (4), located to the left of the keypad panel, must be set according to the type of battery you have installed.

NI-CAD BATTERY - SWITCH IN **DOWN** POSITION
ALKALINE BATTERY - SWITCH IN **UP** POSITION

BATTERY

CHANGING THE BATTERY

Under normal circumstances, an alkaline battery will provide system protection for about six months, and a NiCad battery for about three years. Of course, if there are numerous power interruptions, the battery power will be used up in less time, and it should be replaced when necessary.

THE 24 V.A.C. POWER MUST REMAIN ON WHEN BATTERY IS CHANGED.

This is necessary to retain controller memory. If you should lose your program, the display will show 0100A 01 to alert you that re-programming is necessary.

WARNING



WHEN CHANGING THE BATTERY, EXTREME CARE MUST BE TAKEN TO PREVENT BATTERY TERMINALS TOUCHING ANY METAL PART OF THE CONTROLLER. DAMAGE OR INJURY MAY RESULT.

Your IC Controller clock uses a standard AM/PM mode. The time display will be followed by an A (A.M.) or P (P.M.). Midnight will show as 1200A and noon will show as 1200P.






The display will flash on and off if a programming error is detected. Press ERASE and re-program if this occurs.

TO ADJUST CLOCK

PRESS KEYPADS

AS FOLLOWS:

DISPLAY EXAMPLES

- | | | TIME | DAY |
|----------|---|---|------------|
| 1 |  | To enter clock program. | 0 0 0 0 A |
| 2 |  | To adjust hours.
Hold pad down to advance hours to correct time.
Display shows "A" for A.M. and "P" for P.M. times. | 0 6 0 0 P |
| 3 |  | To adjust minutes.
Hold pad down to advance minutes to correct time. | 0 6 4 5 P |
| 4 |  | To place the time in the controller memory. | 0 6 4 5 P |
| 5 |  | To return to automatic system control | 0 6 4 5 P |

Your controller will now continue to maintain the correct time.

CONTROLLER PROGRAMMING

■

To simplify understanding of IC Controller programming, the procedure has been set up in a series of steps:

1 ACTIVE DAY PROGRAMMING

Programs the ACTIVE DAYS on which your system will run, and synchronizes the computer with the current day.

2 WATERING RUN TIME PROGRAMMING

Sets watering RUN TIMES for the entire system.

3 WATERING START TIME PROGRAMMING

Sets watering START TIMES for the each station.

Before programming your controller, it is suggested that the WATERING PLAN RECORD is used to work out and record your watering plan.

■

1 ACTIVE DAY PROGRAMMING

The controller operates on a 14-day repetitive program cycle. The fourteen days are pre-coded into the controller memory according to this chart:

	SUN	MON	TUE	WED	THU	FRI	SAT
WEEK 1	01	02	03	04	05	06	07
WEEK 2	08	09	10	11	12	13	14


DAY CODE CHART

As each day is displayed, it may be retained as an ACTIVE watering day, or made INACTIVE if no watering is desired.

PRESS KEYPADS

AS FOLLOWS:

DISPLAY EXAMPLES


1  To enter the
DAY PROGRAM

DAY
0 0

2  To display
DAY 1


DAY
0 1

3 Press either:

 To make Day 1
ACTIVE

ACTIVE DAY
INDICATOR ON

OR


 To make Day 1
INACTIVE

ACTIVE DAY
INDICATOR OFF


(continued)


1 ACTIVE DAY PROGRAMMING

DISPLAY EXAMPLES

4 Move through each day by pressing,  and program each of the fourteen days as ACTIVE or INACTIVE.

DAY
02

5 WHEN YOU'RE FINISHED, PRESS  AS REQUIRED, TO RESET THE DISPLAY TO CURRENT DAY, ACCORDING TO THE DAY CODE CHART.

6  To return to automatic system control

TIME,
DAY NUMBER
AND ACTIVE STATUS


2 WATERING RUN TIME PROGRAMMING

The watering run time for each station in your irrigation system may be programmed in one of sixteen time settings:

MINUTES: 00,01,02,03,05,07,09,12,15,20,25,30,
35,40,50 or 60




Select the time that you need for each watering station. You'll probably find it convenient to record them on your watering plan record before actually programming them into the controller.

Use the "00" setting if you don't want a particular station to run.

If you make an incorrect entry, press  and start again.

PRESS KEYPADS AS FOLLOWS:

DISPLAY EXAMPLES

- | | | | | |
|----------|---|---|----------------|-------------------|
| 1 |  | To enter the STATION SET program | 0
STA
NO | 00
RUN
TIME |
| 2 |  | To advance to the station you wish to program. | 1
STA
NO | 00
RUN
TIME |
| 3 |  | To select the desired run time for that station.
When the run time you want is displayed, press... | 1
STA
NO | 35
RUN
TIME |

(continued)

2 WATERING RUN TIME PROGRAMMING



To place your selected time in the controller memory

Repeat steps 2 through 4 until watering run times have been selected and entered for all stations.



To return to automatic system control TIME, DAY NUMBER AND ACTIVE STATUS

NOTE: CHANGES MADE IN WATERING RUN TIMES MAY ALSO AFFECT WATERING START TIMES. ALWAYS CHECK BOTH PROGRAMS.

WATERING START TIME PROGRAMMING


Your irrigation system may be programmed for up to three watering start times in a 24-hour period, timed to start at any selected hour. Random minute start times are not programmable.

Remember that enough time must elapse between start times for all stations to cycle through their run times, because if a new start time becomes active before the previous cycle is finished, the new start time will be automatically postponed until the cycle in progress is completed.


TO PROGRAM WATERING CYCLE START TIMES, PRESS KEYPADS AS FOLLOWS:


DISPLAY EXAMPLES

1		To enter START TIME program	TIME
			0000 A

2		To advance the display to the hour desired for Start Time 1.	TIME
			1100 A

OR

	To delete a previously-entered Start Time	TIME
		0000 A

3		To place the Start Time in the controller memory.	

(continued)

WATERING START TIME PROGRAMMING



DISPLAY EXAMPLES



To move to the next
Start Time

Repeat steps 2, 3 and 4
for all required start
times. (Three maximum).



To return to
automatic control.


TIME,
DAY NUMBER
AND ACTIVE STATUS


With the completion of these steps, you have program-
med the controller to operate your irrigation system.




CHECKING YOUR WATERING PROGRAM

Any portion of your watering program can be checked on the Controller display without affecting the programming.

- To check ACTIVE DAYS, press 


Cycle through the days by pressing 


**Remember to return DAY
setting to CURRENT DAY**

To return to clock control, press 


- To check STATION RUN TIMES, press 

Cycle through each STATION by pressing 

To return to clock control, press 

- To check START TIMES, press 

Cycle through all Start Times by pressing 

To return to clock control, press 


REFER TO PROGRAMMING INSTRUCTIONS TO
MAKE ANY REQUIRED CHANGES

MANUAL SYSTEM OPERATION

MANUAL operation will enable you to start a programmed watering cycle immediately, but will not affect the program memory. Following completion of any MANUAL watering cycle, your Controller will return to automatic system control.


If you use the STOP keypad during a manual operation, you must also press GO, in order to return the controller to the automatic mode.

If you wish to exit the MANUAL mode, (and you have not pressed GO), you may do so by pressing ERASE.


Press:  To switch your controller to MANUAL OPERATION.


You now have four options:

To start your **complete watering program** immediately, press:

 The programmed watering sequence will start.

OR: To start a **portion of watering program** immediately, press:

 To move the display to the station number at which you want to begin.

 To start the programmed watering sequence at the selected station.

(continued)

MANUAL SYSTEM OPERATION

OR: To operate **one selected station** immediately, press:



To move the display to the Station Number at which you want to operate.



THE RUN TIME MUST BE CHANGED.
(Program memory will not be affected)



To start watering immediately.

OR: To operate **all programmed stations** in numerical sequence:



Station 1 will begin watering




To index through programmed stations.


SYSTEM SHUTDOWN

For immediate, temporary shutdown,
press:

DISPLAY EXAMPLES

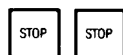
 To enter
shutdown mode.
All programmed
watering will stop.

TIME	DAY
1 1 2 4 A	C

 To reactivate the
watering system.

TIME, DAY NUMBER
AND ACTIVE DAY STATUS
WILL DISPLAY


For extended system shutdown,
press:



TIME	DAY
1 1 2 4 A	P C

The controller will “stand by”
indefinitely, as long as power
is maintained

To re-activate your system, press:

 Your controller will
resume automatic
operation

TIME, DAY NUMBER
AND ACTIVE DAY STATUS
WILL DISPLAY

FUSE REPLACEMENT

A fuse is provided to protect your IC Controller.

IN CASE OF A BLOWN FUSE, DETERMINE CAUSE OF FAILURE AND TAKE CORRECTIVE ACTION BEFORE RECONNECTING POWER.

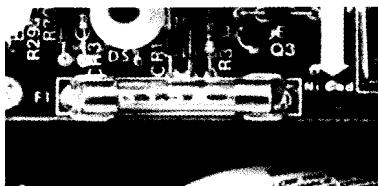


WARNING

DISCONNECT 24 V.A.C. POWER BEFORE SERVICING FUSE. FAILURE TO DO THIS MAY CAUSE AN ELECTRICAL HAZARD WHICH COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE

TO REPLACE FUSE:

Release faceplate and locate fuse (6).



Replace fuse with 1.5 ampere, 250-volt fuse (Littelfuse 312 3AG or equivalent)


CAUTION: USE OF ANY HIGHER-RATED FUSE IS DANGEROUS AND MAY RESULT IN SEVERE DAMAGE TO THE CONTROLLER.

Replace faceplate and secure with screw fastener.

Plug in transformer.

If you are experiencing a controller problem, check the following possible solutions before calling a service technician:

TROUBLESHOOTING

- **DISPLAY GOES BLANK** (Indicates a power loss):
 - Check electrical connection.
 - Check fuse and replace if necessary.
- **STATION AUTOMATIC WATERING DOES NOT OPERATE**
 - This may be due to programming error.
 - Check program.
- **DISPLAY SHOWS 0100A 01**
 - This indicates that all controller memory has been erased because of AC power failure and dead battery. Check that power is re-established; replace battery, and re-program the controller.
- **DISPLAY FLASHES DURING PROGRAMMING**
 - A programming error was made. Press  and continue programming.
- **WATERING WILL NOT STOP**
 - Press STOP; use shutdown procedure (Page 16); disconnect power or turn off water valve.

■

Your TORO Dealer or Irrigation Contractor will be pleased to provide any necessary assistance in maintaining your IC Controller in top condition. It is suggested that the telephone number to call is written in the space below, and inside the Controller case for easy reference.

FOR SERVICE, CALL:

ELECTRICAL SPECIFICATIONS:

Input Power To Transformer: 105/130 V.A.C.,
60 Hz., 0.5 amp.

Station Output: 24 V.A.C., 60 Hz., 0.5 amp. holding/
1 amp. inrush.

Pump Output (Master Valve): 24 V.A.C., 60 Hz., 0.35
amp. holding/ 0.7 amp.
inrush.

■
