User's Guide

TORO. Count on it.

Intelli-Sense Professional Controllers 12-, 24-, 36-, and 48-Station Models

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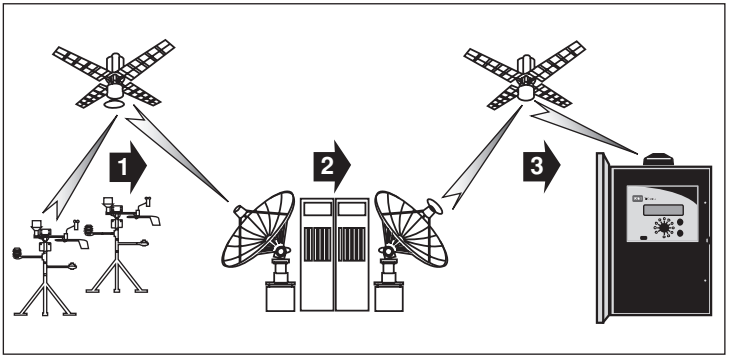
Introduction

Congratulations on selectingToro, the proven leader in smart irrigation. Twenty public agency studies and thousands of customers make it clear— the Toro Intelli-Sense Commercial controllers with WeatherTRAK technology are #1 in saving water, protecting landscapes, reducing runoff, and satisfying customers. The Toro Intelli-Sense Professional controller series, available in 12, 24, 36 and 48 station-count models, dynamically adjust irrigation based on current ET (evapotranspiration) conditions, received each day via radio transmission from the WeatherTRAK ET Everywhere® subscription service.

Some Key Features of the TIS-PRO Controllers

- Reliable Toro-built irrigation controller.
- WeatherTRAK's exclusive irrigation scheduleing software.
- The flexibility of 12, 24, 36 and 48 station-counts models to meet a wide variety of irrigation system needs.
- Four independent irrigation programs
- Integrated flow management and reporting utilities with flow sensing and leak detection at station and system level.
- User alerts relating to flow, valves, communications, scheduling and more.
- Station-specific programming of watering days, run times, start times and cycle/soak periods.
- Automatic syringe irrigation for high ET-rate conditions.
- Toro Handheld Remote and Rain/Freeze Sensor ready.
- Large, easy-to-read liquid crystal display.
- Built-in surge protection.
- Non-volatile memory.
- Weather and vandal-resistant heavy-gauge steel cabinet.
- Weather-proof external antenna.

How the ET Everywhere Service Works



1 - The WeatherTRAK ET Everywhere service collects data from over 25,000 monitoring stations including the National Oceanic and Atmospheric Administration (NOAA) network, state and county networks, and private weather stations.

2 - Proven scientific modeling techniques are then used to calculate and validate specific ET data down to one square kilometer.

3 - The ET data is uploaded to a communications satellite where it received nightly by the intelli-Sense controller to automatically recalculate station-specific irrigation parameters for the next scheduled watering day.

⚠ **Important: The ET Everywhere subsciption service is not included with the purchase of the Intelli-Sense controller. For service subscription information, contact WeatherTRAK customer service at 1-800-362-8774 during normal business hours.**

Chapter 1
Getting Started

The following checklist provides the basic steps required for Intelli-Sense Professional Controller installation, setup, programming and operation.

☑ Thoroughly inspect the irrigation system for proper design, installation and operating condition, leaks, as well as broken heads and pipes. The performance of your new controller depends on the integrity of the irrigation system design and installation. You will maximize the performance of your controller when the irrigation system is well maintained.

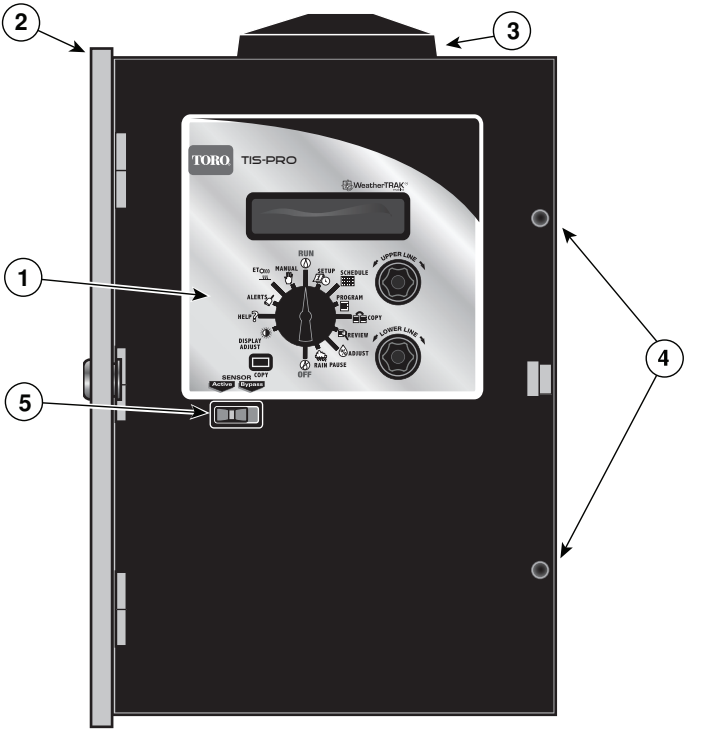
☑ Install per the provided intallation instructions. (See Installation Instructions beginning on page 69).

☑ Fill out the Intelli-Sense Control System Profile spreadsheet with as much accurate detail as possible. Have the spreadsheet on hand when performing the controller setup and programming procedures.

☑ Program the controller. This manual provides step-by-step instructions for programming the controller based on the information captured on the System Profile spreadsheet.

☑ Activate the WeatherTrak ET Everywhere subscription service. This necessary and important step enables the Intelli-Sense to receive daily ET updates.

Controller Hardware Overview



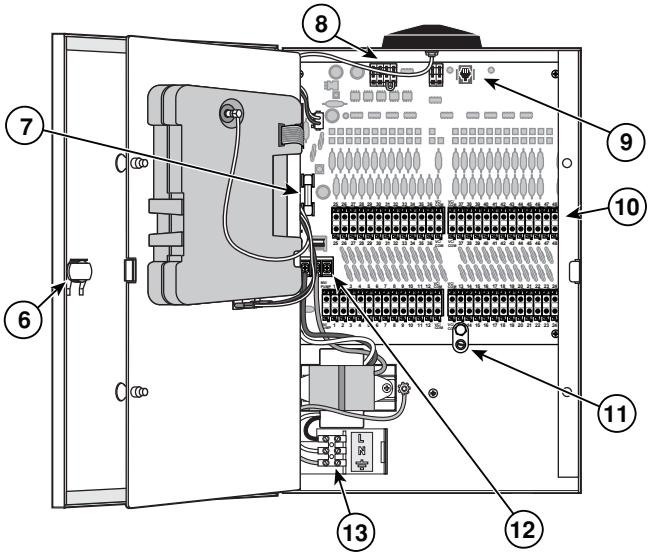
1 - Intelli-Sense Control Module - (See page 6 for details.)

2 - Enclosure - Weather- and vandel- resistant heavy-gauge steel cabinet with locking cover.

3 - Weatherproof External Anatenna - Provides exceptional reception in most locations.

4 - Hinged Access Panel Fasteners - Thumbscrew fasteners secure hinged control panel for ease of access without tools.

5 - Rain Sensor Control Switch - Slide switch provides manual override control of auxiliary rain sensor.



6 - Control Module Latch - Enables control module to be easily removed without disturbing controller installation.

7 - Fuse - 2A Slo-Blo fuse provides short-circuit protection on the 24 VAC output circuit.

8 - Flow and Rain Sensor Connection Terminal Block Quick release wire terminals for easy, secure connections.

9 - TMR-1 Handheld Remote Connections - Provides RJ-11 plug receptacle and 24 VAC power source for TMR-1 handheld remote reciever connection.

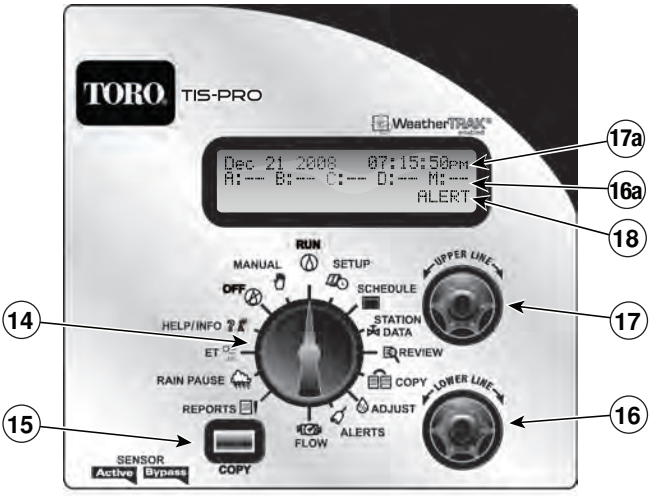
10 - Valve Wire Connection Terminal Blocks - Screwless, quick release control wire terminals for easy installation.

11 - Earth-ground Lug - Heavy-duty ground lug accepts 10 AWG solid-copper wire from earth ground device.

12 - Hot Post - Provides a constant 24 VAC power source to assist in valve identification for initial installation, system service and troublshooting procedures.

13 - Main Power Connection Terminal Block - Screw terminals for 120 VAC input power wires.

Control Module Overview



14 - Function dial - Turn this dial in either direction to select controller setup and operational functions:

RUN - The normal position for automatic operation. Current time/date and controller activity is displayed.

SETUP - Select and define specific controller setup and operating parameters.

SCHEDULE - Set up and adjust start times/water windows and watering day schedules.

STATION DATA - Select and define specific station setup and operating parameters.

REVIEW - Review current program information for each station, and flow sensor setup and data log.

COPY - Transfer station or program information from one station or program to another. Also used to reset station, setup and program default settings.

ADJUST - Adjust station watering by 5% increase or decrease of run time and/or watering days.

ALERTS - Display system problems and operationalconflicts.

FLOW - Set flow meter attributes and operational partameters.

REPORTS - Access and review station run time and flow data by day, week or month time periods.

RAIN PAUSE - Suspend automatic watering for a period of 1 to 14 days.

ET - Display current daily and average weekly ET values. Set custom Kc and weekly ET values.

HELP/INFO - Access various controller activation setup data, operational preferences, and status information.

OFF - Terminate and suspend all watering activity.

MANUAL - Access manual watering operations.

15 - Copy button – The Copy button is used in various operations including copying and transferring station and program data, restoring default settings and reviewing various setup, station, and flow data.

16 - Lower Line knob - This knob is used to select and/or adjust data viewed on the lower line of the display (**16a**).

17 - Upper Line knob - This knob is used to select setup and program control options shown on the upper line of the display (**17a**).

18 - Information Line - The third line of the display provides supplemental information including the Alert prompt.

Notes

Chapter 2
Controller Setup

The SETUP function menu consists of 10 screens listed in the following order:

- **Adjust Display Contrast**
- **Set Controller Clock**
- **Set Time Zone**
- **Set Auto Daylight Savings option**
- **Set Maximum Active Stations**
- **Select Stack or Overlap option**
- **Set Master Valve Type/Pump Start option**
- **Select Runtime Valve Test**
- **Set Maximum Backup ET**

About Controller Input

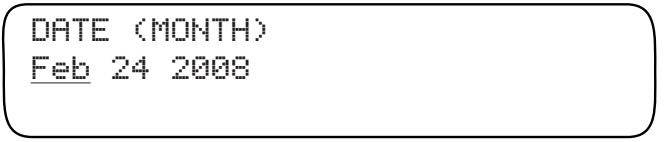
As you begin the controller setup procedures, you will find that virtually all user-defined input is accomplished in the same manner using the **Function** dial**, Upper Line** knob, and **Lower Line** knob. For example, when you turn the **Function** dial to the SETUP position, the first screen in the **Setup** menu will be displayed. In this case, **Adjust Display Contrast** will be displayed on the upper line and the default contrast value of 224 will be displayed on the lower line.

The contrast value is underscorred and flashing, indicating that it is selected and can be changed or edited by turning the **Lower Line** knob. The information displayed on the screen when the **Upper Line** knob or **Function** dial is turned in either direction, enters the information into the controller memory.

Set Controller Clock

1. With the **Function** dial in the SETUP position, turn the **Upper Line** knob to select the following display:

2. Turn the **Lower Line** knob to set the current year.
3. Turn the **Upper Line** knob right to select the next menu item, **Date (Month)**.



4. Turn the **Lower Line** knob to set the current month.
5. Turn the **Upper Line** knob right to select **Date (Day)**.
6. Turn the **Lower Line** knob to set the current day.
7. Turn the **Upper Line** knob right to select **Time (Hour)**.
8. Turn the **Lower Line** knob to set the current hour (**am or pm**).
9. Turn the **Upper Line** knob right to select **Time (Minute)**.
10. Turn the **Lower Line** knob to set the current minute.

Note: Leave the Function dial in the SETUP position to continue selecting and setting the remaining Setup menu items.

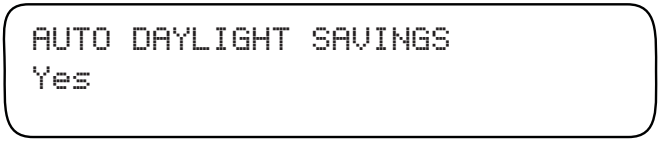
Set Time Zone

1. Within the **Setup** menu, turn the **Upper Line** knob to view the following display:

2. Turn the **Lower Line** knob to select your time zone from the following choices:
   - **Pacific** (default setting)
   - **Alaska**
   - **Hawaii**
   - **Atlantic**
   - **Eastern**
   - **Central**
   - **Mountain**

Select Auto Daylight Savings Option

1. Within the **Setup** menu , turn the **Upper Line** knob to view the following display:



2. The default selection is **Yes** which enables the controller to automatically compensate for Daylight Savings time. To disable this option, turn the **Lower Line** knob to display **No**.

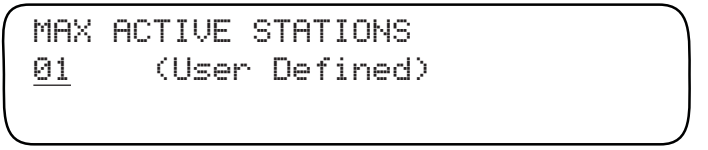
Set Maximum Active Station Count

The actual number of stations being used for irrigation must be entered to enable accurate automatic scheduleing.

⚠ Important: The Intelli-Sense Professional controller firmware provides for the scheduling of 48 stations regardless of controller output configuration. If the actual number of active stations is not set accurately and/or set according to controller output configuration, alert errors and reuced controller performace will result. For example, setting the active station count higher than actual will result in an alert error or will add unnecessary time to the Water Window. Setting the station count lower than actual will cause some stations to be skipped.

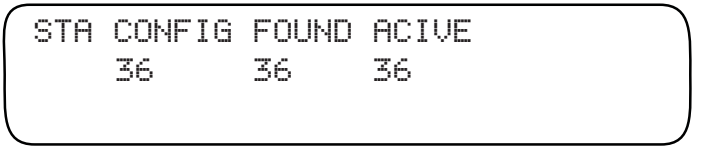
Note: The active station count entered in this step will also determine the number of stations that can be accessed within the Programming , Review and Copy function procedures.

1. Within the **Setup** menu, turn the **Upper Line** knob to view the following display:



2. To change the number of active stations, turn the **Lower Line** knob.

   Note: To review the current station configuration, press the **Copy** button when SETUP function is selected.



   Note: The abbreviated display information indicates the following:
   STA CONFIG = Controller model configuration of 36 or 48 stations
   FOUND = Actual number of stations recognized by controller
   ACTIVE = Maximum active station count selected.

Select Stack or Overlap Option

When the **Stacking** option is selected, the controller will be constrained to operate **one station at a time**. The Water Window start time and duration selected for Automatic Schedule **A** will also be assigned to Automatic Schedule **B, C** and **D**.

When the **Overlap** option is selected, the constraint is removed, allowing multiple programs to run simultaneously.
When Overlap is selected, Start time and Water Window options are available in all schedules.

⚠ Important: Prior to selecting the Overlap option, confirm that the irrigation system hydraulic capacity and the controller's maximum current draw capacity (2.0A) will not be exceeded if four stations and master valve circuit are operated concurrently.

⚠ Important: When the STACK option is selected within the Setup menu, the start time and water window parameters defined for Program A will apply to <u>all</u> progams, and can not be edited by individual program.

If the OVERLAP option is selected, separate start time and water window parameters can be defined for each program.

1. Within the **Setup** menu, turn the **Upper Line** knob to view the following display:

2. The **Stack** option is seleted by default. To select the **Overlap** option, turn the **Lower Line** knob to display **Overlap**.

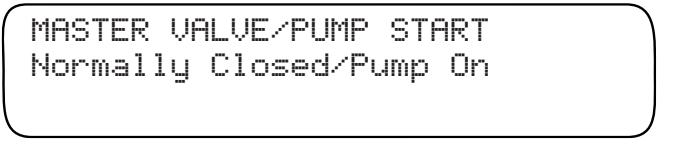
Set Master Valve/Pump Start Option

The controller features a dedicated master valve/pump start output as a standard feature. The master valve is used to isolate the mainline or a portion of the mainline when programmed as part of flow monitoring. It enables the controller to troubleshoot and isolate pipe malfunctions or other problems. Three choices provided are:

- Normally Closed/Pump On (default)
- Normally Open/Pump Off
- None

Note: If a pump station is in use but no master valve is required, use the **Normally Closed/Pump On** option.

1. Within the **Setup** menu, turn the **Upper Line** knob to view the following display:



2. Turn the **Lower Line** knob to select the preferred option.

Assign Pump Start Output

The controller allows the user to assign a pump start to a station output, effectively decreasing the controller station count by 1. The assigned station will be active with all stations. This feature is typically used in combination with a normally-open (NO) type master valve to enable the pump to operate while the NO master valve remains de-engerized (open).

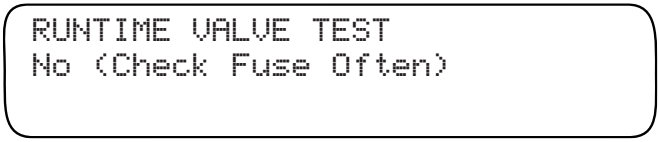
1. Within the setup Menu, turn the **Upper Line** knob to view the following display:

2. Turn the **Lower Line** knob to select the station number to be designated as the pump start output.

Set Runtime Valve Test Option

The controller features a **Valve Test** feature that will test each station for a short-circuit condition each time it is activated. If a fault is detected, an **Alert** will be posted, enabling identification and repairs to be made.

1. Within the **Setup** menu, turn the **Upper Line** knob to view the following display:



2. Turn the **Lower Line** knob to select **Yes** or **No** as preferred.

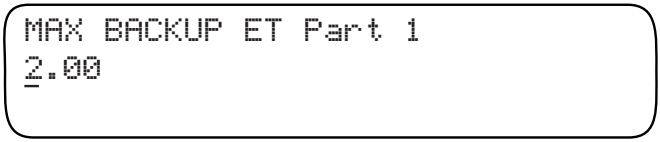
Set Maximum Backup ET

The **Maximum Backup ET** value is a failsafe measure used by the controller to calculate daily watering requirments in the event that current ET Everywhere data is not recieved for an extended period.

The Maximum Backup ET default value of **2.00** is automatically entered to help compensate for seasonal weather changes.

Note: The Maximum Backup ET is adjustable from 0.50 – 3.99 The whole number is only adjustable to 0 when the decimal number value is .50 or higher.

1. Within the **Setup** menu, turn the **Upper Line** knob to view the following display:



2. The whole number of the **Maximum Backup ET** value is selected by default. To adjust the value from **1 – 3**, turn the **Lower Line** knob.

3. Turn the **Upper Line** knob right one stop to select the decimal number.

4. Turn the **Lower Line** knob to adjust the decimal number value.

Notes

Chapter 3
Set Program Schedule

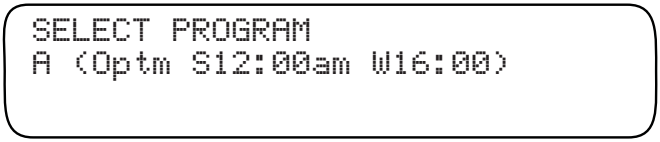
The Intelli-Sense Professional Controller enables four independent program schedules (A, B, C and D) to be defined by one or two start times with associated water window and a specific watering day schedule. Each station is then assigned to one of the programs in the Station Data function.

⚠ Important: When the STACK option is selected within the Setup menu, the start time and water window parameters defined for Program A will apply to <u>all</u> progams, and can not be edited by individual program.

If the OVERLAP option is selected, separate start time and water window parameters can be defined for each program.

Select Program

1. Turn the **Function dial SCHEDULE** to view the following display:



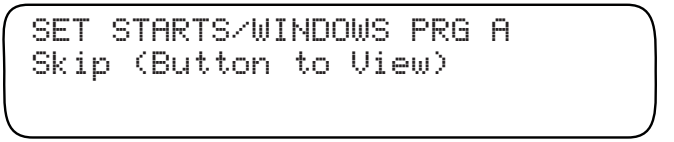
   Program **A** is selected by default. The current watering day schedule, start time and water window information is shown for Program A.

   Note: The abbreviated display information indicates the following:
   Optm = Watering day schedule is Optimized by WeatherTRAK
   S12:00am = Start Time is 12:00 a.m.
   W16:00 = Water window duration is 16 hours.

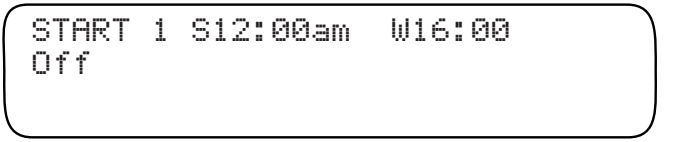
2. To change the program selection, turn the **Lower Line** knob to select program **B**, **C** or **D**.

Set Program Start Start Time and Water Window

1. Within the **Schedule** menu, turn the **Upper Line** knob to select the following display:

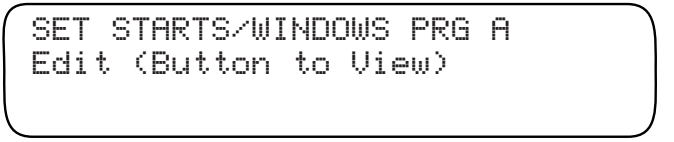


Note: To review the current start time/water window settings, press the **Copy** button. The abbreviated information will be displayed as shown in the example below.

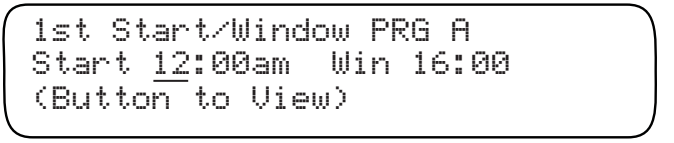


Start 1 = 12:00 a.m., water window is 16 hours in duration, and Start Time 2 is turned off.

2. **Skip** is selected by default. To edit the selected program, turn the **Lower Line** knob to select **Edit**.



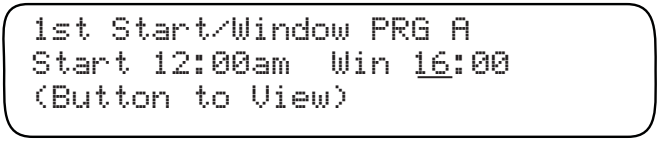
3. Turn the **Upper Line** knob to select the following display:



4. The start time hour is underlined and flashing, indicating that it can be edited. Turn the **Lower Line** knob to set the start time hour, or turn the **Upper Line** knob right to select next element of the screen to be edited.

Note: Water window is the duration of time allotted for all stations, assigned to the program to complete their programmed watering cycle(s). The water window duration is adjustable from 1 hour to 23 hours and 59 minutes. The controller provides the water window end time by factoring the selected start time and duration.

5. Turn the **Upper Line** knob right to select water window duration.



6. Turn the **Lower Line** knob to adjust number of hours, or turn the **Upper Line** knob right to select minutes and edit as preferred.

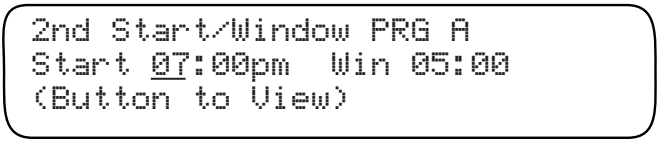
   Note: A second program start time/water window is provided for automatic syringe watering where compensation for higher than normal ET is desired. Labeled **High ET** start, the controller automatically reduces the total station watering amount during this syringe operation to 25% of normal.

   To prevent operational conflicts due to overlapping watering cycles, the following setup criteria must be considered:

   - The 2nd start time cannot occur within the 1st start time cycle
   - The combined water window duration cannot exceed 23 hours and 59 minutes.

   If an **Overlap** condition alert is posted, the source of the conflict must be resolved. If not corrected, the 2nd start time will default to the Off mode. Press the **Copy** button to compare settings. Also refer to the **Alerts** function on page 44 for additional information.

7. Turn the **Upper Line** knob right to select the **2nd Start Type** screen. The High ET start time option is **Off** by defualt. To program, turn the **Upper Line** knob right to display the following setup screen.



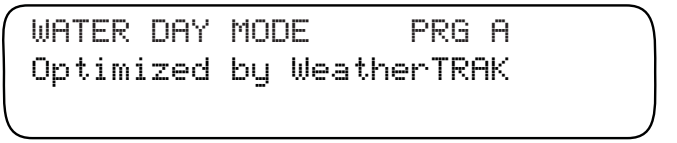
8. Repeat the editing procedure used to enter the 1st start time and water window.

Set Program Water Day Mode

Each program can be assigned to unique water day schedule using one of the following options:

- **Optimized by WeatherTRAK** - Water day schedule selected automatically by the Intelli-Sense scheduling engine.
- **Odd/Even** - Odd or Even numbered calendar days.
- **Interval** - Water days set by frequency ranging from 1 to 30 days.
- **Days of Wee**k - Specific days of the week (same all months)
- **Days of Week by Month** - Specific days of the week for each month.
- **Off** - Turn program off.

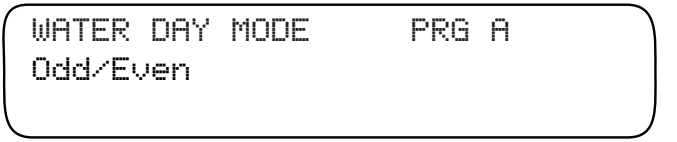
1. With the **Function** dial in the SCHEDULE position, turn the **Upper Line** dial to view the following display:



2. **Optimized by WeatherTRAK** is selected by default. To use this mode, continue at step 3. To use an alternate mode, continue at the appropriate following section.
3. Turn the **Upper Line** knob to select the Day Exclusion feature that enables a weekday to be excluded from operation.
4. Turn the **Lower Line** knob to display the day name or None.

Odd/Even

1. Turn the **Lower Line** knob to select **Odd/Even**.



2. Turn the **Upper Line** knob to display **Odd**.
3. Turn the **Lower Line** knob to select **Even**.

Interval

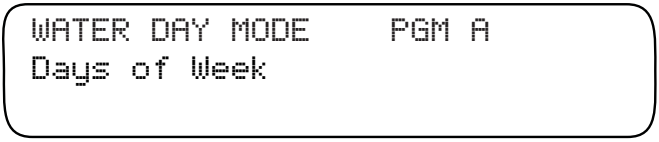
1. Turn the **Lower Line** knob to select **Interval**.

2. The default Interval is **01** which schedules every day as active. To select an Interval from **02 – 30**, turn the **Lower Line** knob.

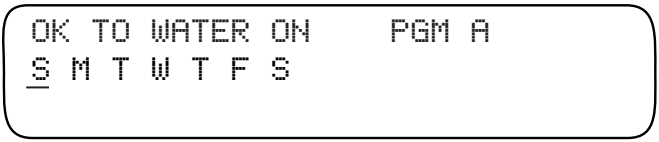
   Note: The current day is the first active day of the Interval schedule. For example, if today is Saturday and a 02 interval (water every-other-day) is set, today will be active. The next active watering day will be Monday.

Days of Week

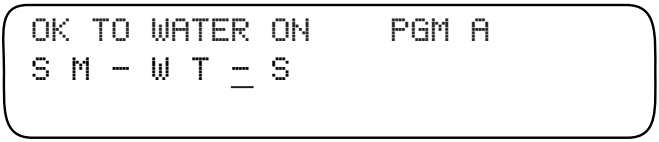
1. Turn the **Lower Line** knob to select **Days of Week**.



2. Turn the **Upper Line** knob to view the following display:

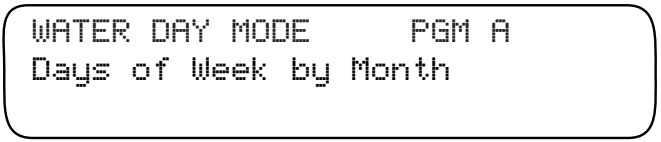


3. By default, every day is an active watering day. To remove days from the schedule, turn the **Upper Line** knob to select the day indicator, then turn the **Lower Line** knob to replace the indicator with a dash (as shown in the following example).



Days of Week by Month

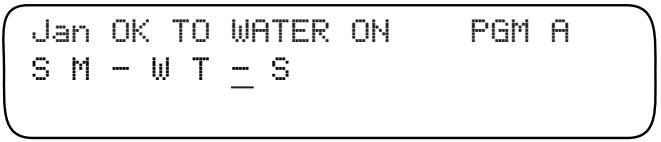
1. Turn the **Lower Line** knob to select **Days of Week by Month**.



2. Turn the **Upper Line** knob to view the following display:

3. By default, every day of every month is an active watering day. To omit specific days from specific months, turn the **Upper Line** knob to select the **month**.

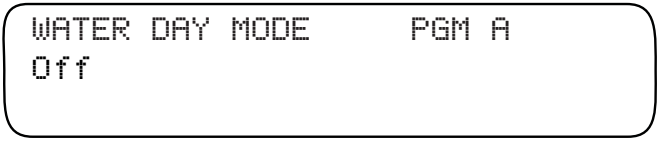
4. To omit specific days, turn the **Upper Line** knob to select the day indicator, then turn the **Lower Line** knob to replace the indicator with a dash (as shown in the following example).



Water Day Mode Off

Selecting the Off water day mode effectively prevents the program from running automatically. To reinstate a program to automatic operation, simply choose an alternate watering day mode.

1. Turn the **Lower Line** knob to select **Off.** .



Chapter 4
Station Data Setup

The Station Data function menu consists of several station setup parameters required for automatic operation.

Four station operating mode options provide the control flexability to program each station for optimum irrigation control.

The station operating mode selections are:

- Automated by WeatherTRAK
- User - With ET (user-defined setup parameters with ET control)
- User - No ET (user-defined setup parameters without ET control)
- Off (station disabled)

Within each operating mode are the following required setup parameters:

Automated By WeatherTRAK:

- Select Station
- Select Station Mode
- Select Program
- Water Window option
- Usable Rainfall
- Sprinkler Type
- Precipitation Rate*
- Sprinkler Efficiency*
- Soil Type
- Plant Type
- Root Depth*
- Microclimate
- Slope Factor
- Sprinkler Location (on slope)

User Defined:

- Select Station
- Select Station Mode
- Select Program
- Water Window option
- Usable Rainfall
- Run Time
- Number of Cycles
- Soak Time
- Reference ET (applies to User - With ET mode only)
- Reference Month (applies to User - With ET mode and watering days by month only)

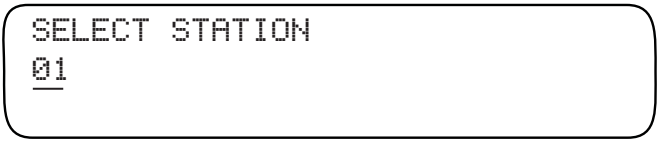
As you can see by the extent of these lists, many factors are required to formulate an accurate baseline watering schedule. To simplify this procedure, Intelli-Sense will select default values based on your entries. You can adjust these values if needed. The items listed with an asterisk (*) will have default values based on the selection made in preceding setup parameter.

Note: To begin the setup process, select Automated by WeatherTRAK mode on page 24, or User-defined modes starting on page 33.

Station Setup Mode: Automated by WeatherTRAK

Select Station

1. Turn the **Function** dial to the **S**TATION DATA position. The **Select Station** menu item is displayed by default.

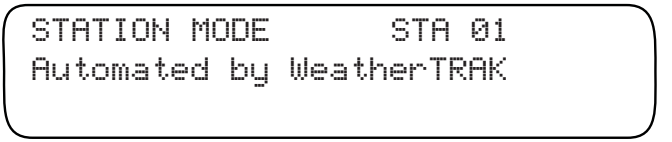


2. Station **01** is selected by default. To change the station number, turn the **Lower Line** knob.

   Note: The Maximum Active Station number defined in **Setup**, determines station number access.

Select Station Mode

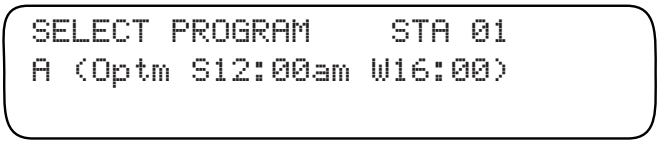
1. Turn the **Upper Line** knob to display **Station Mode**.



2. **Automated by WeatherTRAK** mode is selected by default. If it is not displayed, turn the **Lower Line** knob to select.

Select Program

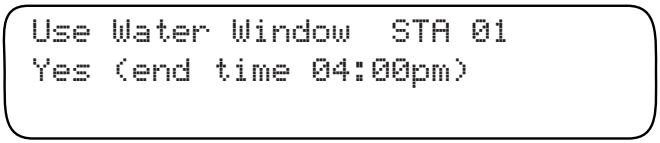
1. Turn the **Upper Line** knob to display **Select Program**.



2. **Program A** is selected by default. To change the program selection, turn the **Lower Line** knob.

Select Water Window Option

1. Turn the **Upper Line** knob to display **Use Water Window**. The current water window end time is automatically calculated and displayed for the selected program.



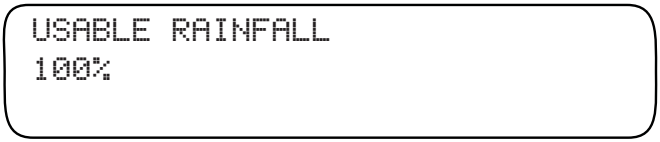
2. **Yes** is selected by default. To disable the water window for the selected station, **t**urn the **Lower Line** knob to select **No.**

Note: By selecting **No**, the station will run until irrigation is complete, regardless of the water window established for the program.

Select Usable Rainfall

The Usable Rainfall setting defines the percentage of the station's watering area exposed to rainfall. This setting is adjustable from None (no rain contact) to 100% (full rain contact) in 25% increments. For example, about 25% of the station zone is covered by a roof overhang. The usable rainfall value for this station would be 75%.

1. Turn the **Upper Line** knob to display **Usable Rainfall**.



2. **100**% is selected by default. To decrease the value, turn the **Lower Line** knob right.

Select Sprinkler Type

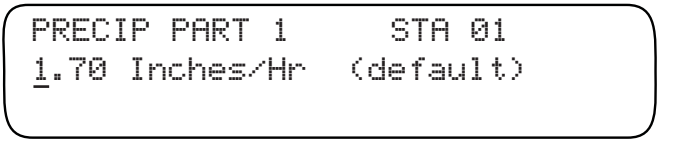
1. Turn the **Upper Line** knob to display **Sprinkler Type**

2. **Spray Head** is selected by default. To choose from the menu of listed sprinker types, turn the **Lower Line** knob.

Set Precipitation Rate

⚠ Important:The sprinkler precipitation rate (PR) is a key factor in the calculation of an automatic watering program. If you know the actual PR value, enter it at this time. If you do not have this information, the baseline PR of the sprinkler type (entered in the previous step) will be entered.

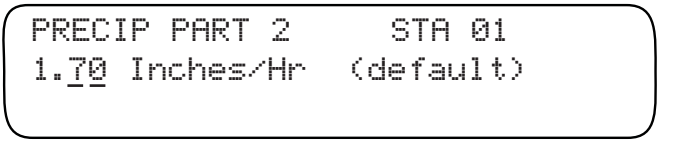
1. Turn the **Upper Line** knob to display **Precip Part 1**.



2. The default **PR** value will be displayed for the sprinkler type selected. The whole number is selected in Part 1. Turn the **Lower Line** knob to adjust the value from **0 – 9**.

   Note: The PR value is adjustable from 0.10 – 9.99 Inches/Hour. The whole number value is adjustable to 0 only when the decimal number value is ≥ 10. Conversely, the decimal number is adjustable to 0 when the whole number is ≥ 1.

3. Turn the **Upper Line** knob right one stop to select the decimal number (Part 2).



4. Turn the **Lower Line** knob to adjust the decimal number value from **00–99**.

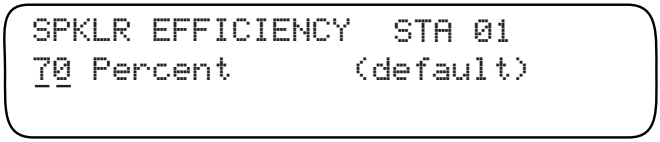
Set Sprinkler Efficiency

Like the sprinkler PR value, the **Sprinkler Efficiency** value is a key factor used by the Intelli-Sense to calculate an efficient watering program for each station. The controller will automatically enter an efficiency value based on the type of sprinkler selected for the station. Changing the efficiency value will alter overall station watering operation as follows:

▲ **Increasing** sprinkler efficiency (sprinkler performs above average), **decreases** overall watering.

▼ **Decreasing** sprinkler efficiency (sprinkler performs below average), **increases** overall watering.

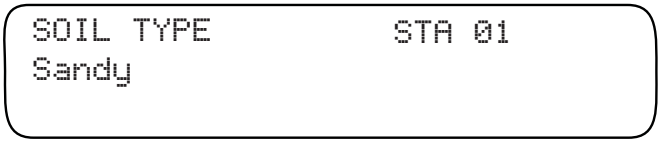
1. Turn the **Upper Line** knob to display **Spklr Efficiency**.



2. The default efficiency value is displayed for the sprinkler type selected. To change the value, turn the **Lower Line** knob to adjust the value from **10 – 95**%.

Select Soil Type

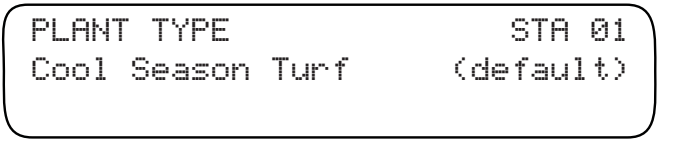
1. Turn the **Upper Line** knob to display **Soil Type**.



2. The soil type displayed is the default for the sprinkler type selected. To change the soil type, turn the **Lower Line** knob to select one the following options:
   - **Sandy**
   - **Sandy Loam** - Higher percentage of sand than clay
   - **Loam** - Equal percentage of sand and clay
   - **Clay Loam** - Higher percentage of clay than sand
   - **Clay**.

Select Plant Type

1. Within the **Program** menu, turn the **Upper Line** knob to select **Plant Type.**



Select from the following Plant Type selections that best matches the plant material in the station:

- Cool Season Turf
- Warm Season Turf
- Combined Turf
- Annuals
- Ground Cover
- Trees
- Shrubs – High Water Use
- Shrubs – Medium Water Use
- Shrubs – Low Water Use
- Mixed – High Water Use
- Mixed – Medium Water Use
- Mixed – Low Water Use
- Native Shrubs/Trees
- Native Grasses
- Custom Plant A
- Custom Plant B
- Custom Turf

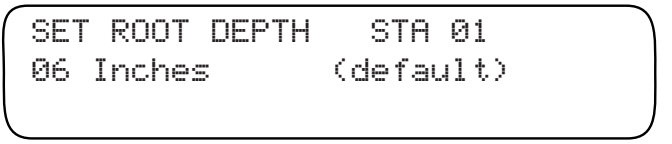
2. The default Plant Type will be displayed, Cool Season Turf. To select an alternate Plant Type, turn the Lower Line knob.

3. Plant factors corresponding to the custom types can be set in the ET menu.

Notes

Set Root Depth

1. Within the **Program** menu, turn the **Upper Line** knob to select **Set Root Depth**.



2. The default root depth will be displayed for the soil type and plant type previously selected. To change the depth, turn the **Lower Line** knob to adjust from **2 – 36** inches.

   Note:

   ▲ Increasing the Root Depth value (root depth greater than average), increases overall watering.

   ▼ Decreasing the Root Depth value (root depth less than average), decreases overall watering.

Select Microclimate

The station **Microclimate** value is the average exposure to sunlight and shade throughout the day. One of following four **Microclimate** options is selected that best describes the average conditions for the station:

- **Sunny All Day** = Sun for 7 to 8 hours per day – no change to the calculated ET rate.
- **Sunny Most of the Day** = Sun for 4 to 6 hours per day – decreases watering by 10% of calculated ET rate.
- **Shady Most of the Day** = Shady for 4 to 6 hours per day – decreases watering by 20% of calculatd ET rate.
- **Shady All Day** = Shady for 7 to 8 hours per day – decreases watering by 30% of calculated ET rate.

1. Turn the **Upper Line** knob to select **Set Microclimate**.

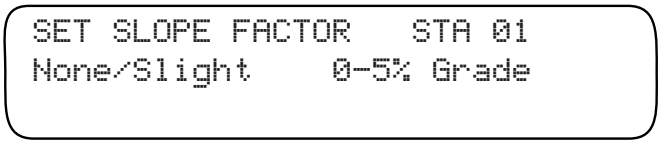
2. **Sunny All Day** is selected by default. To select an alternate microclimate, turn the **Lower Line** knob.

Select Slope Factor

The **SlopeFactor** is an important component used in the automatic watering program calculation to determine the amount of run time and number of repeat cycles required per watering day.
The **Slope Factor** options are as follows:

- **None/Slight 0 – 5% Grade**
- **Gentle 6 – 8% Grade**
- **Mild 9 – 12% Grade**
- **Moderate 13 – 20% Grade**
- **Steep >20% Grade**.

1. Turn the **Upper Line** knob to select **Set Slope Factor**.



2. **None/ Slight (0 –5%)** grade is selected by default. To select an alternate **Slope Factor**, turn the **Lower Line** knob.

   Note: To prevent runnoff, selecting any slop factor other than **None/Slight** will result in a **decrease** in station run time per cycle and an **increase** in the watering cycle frequency.

Select Sprinkler Location

Note: If a Slope Factor of None/Slight is selected, Sprinkler Location setting is not enabled.

1. Turn the **Upper Line** knob to select **Sprinklr Location**.

2. **None, No Slope Set** is selected by default. To choose an alternate **Sprinkler Location**, turn the **Lower Line** knob to select one of the following options:
   - **All Parts of Slope** (default if Slope Factor is other than None)
   - **Top of Slope**
   - **Middle of Slope**
   - **Bottom of Slope**.

Completing Station Setup

1. Turn the **Upper Line** knob to select **Station (01) Complete.**

2. The next station number in sequence will be selected. To select a different station, turn the **Lower Line** knob. Turn the **Upper Line** knob to continue with the station setup procedure.

⚠ Important: To set up additional stations with the same or similar operating parameters, use the COPY function to transfer station setup data from one station to another or to all stations at the same time. Minor adjustments to individual stations can then be made quickly and easily. See Using the Copy Function on page 38 for details.

Station Setup Modes: User Defined

Within the **User-defined** station mode are two format options: **User - With ET** and **User - No ET**. Both formats require the same basic setup process, with the exception that **User - With ET** mode enables a **Reference ET** and (optional) **Reference Month** value to be selected.

When the **User - With ET** option is used, the station's baseline watering progam is updated daily by the ET Everywhere service and adjusted automatically to suit current ET conditions.

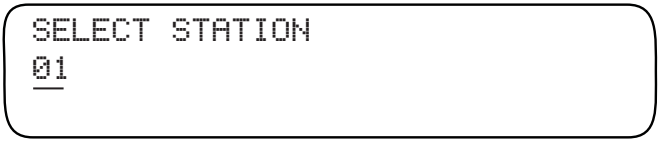
When the **User - No ET** option is used, the station's watering progam remains constant, without regard to changes in ET.

A User-defined watering program is established for the station with the setup parameters in the following menu order:

- **Select Station**
- **Select Program**
- **Select Water Window option**
- **Set Usable Rainfall**
- **Set Run Time**
- **Select Number of Cycles**
- **Set Soak Time**
- **Set Reference ET (User - With ET format only)**
- **Set Reference Month (optional)**

Select Station

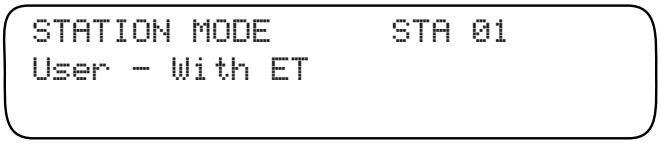
1. With the **Function** dial in the **Station Data** position, turn the **Upper Line** knob to display **Select Station**.



2. Station **01** is selected by default. To change the station number, turn the **Lower Line** knob.
   Note: The Maximum Active Station number defined in **Setup**, determines station number access.

Select Station Mode

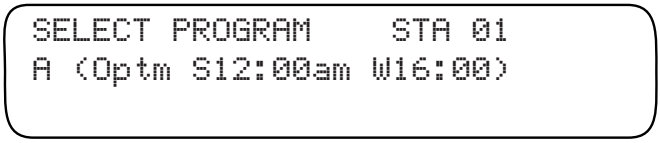
1. Turn the **Upper Line** knob to display **Station Mode**.



2. Turn the **Lower Line** knob to select **Use - With ET** or **User - No ET**.

Select Program

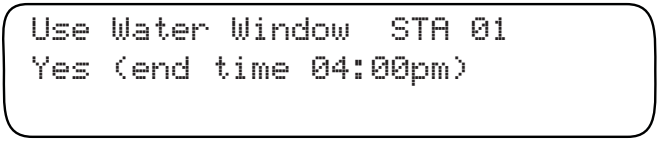
1. Turn the **Upper Line** knob to display **Select Program**.



2. **Program A** is selected by default. To change the program selection, turn the **Lower Line** knob.

Select Water Window Option

1. Turn the **Upper Line** knob to display **Use Water Window**.

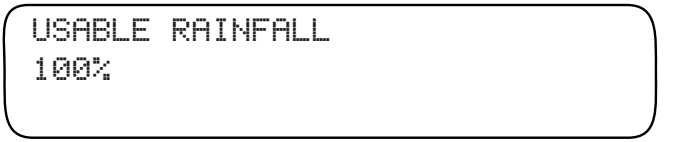


2. **Yes** is selected by default. To enable the station to ignore a water window constraint, turn the **Lower Line** knob to select **No.**

Select Usable Rainfall

The Usable Rainfall setting defines the percentage of the station's watering area exposed to rainfall. This setting is adjustable from None (no rain contact) to 100% (full rain contact) in 25% increments. For example, about 25% of the station zone is covered by a roof overhang. The usable rainfall value for this station would be 75%.

1. Turn the **Upper Line** knob to display **Usable Rainfall**.

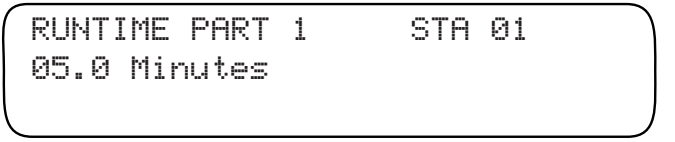


2. **100**% is selected by default. To decrease the value, turn the **Lower Line** knob right.

Set Station Run Time

The station run time defines how long the station will operate during the watering cycle. The run time is adjustable from 1 to 99. 9 minutes.

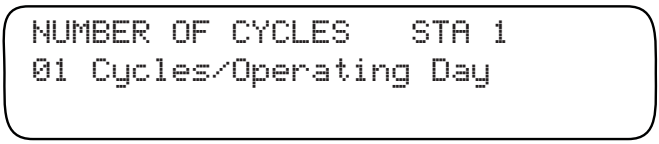
1. Turn the **Upper Line** knob to display **Runtime Part 1**



2. Turn the **Lower Line** knob to adjust the whole number value from **01** to **99**.
3. Turn the **Upper Line** knob right to select the decimal value (**Runtime Part 2**).
4. Turn the **Lower Line** knob to adjust the decimel number value from **0** to **9**.

Select Number of Cycles

1. Turn the **Upper Line** knob to select **Number of Cycles**.



2. The number of watering cycles per watering day is set to **1** by default. To adjust the number between **0 – 20** cycles per operating day, turn the **Lower Line** knob.

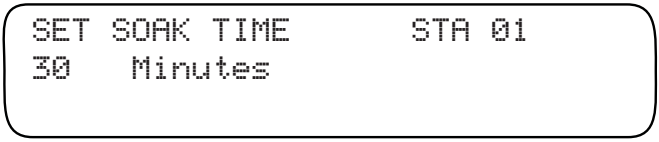
   Note: Selecting **0** cycles will prevent the station from operating during automatic watering operations.

Set Soak Time

Soak Time is an adjustable delay period that occurs between station watering cycles to help promote deeper rooting, and to avoid pooling, runoff and soil erosion. Soak Time is adjustable from 0–480 minutes in 10-minute increments.

Note: The Soak Time is actually the minimum delay that can occur before the station can run again. The actual delay period may be longer due to the programming variables of other stations assigned to the same watering program.

1. Turn the **Upper Line** knob to select **Set Soak Time**.

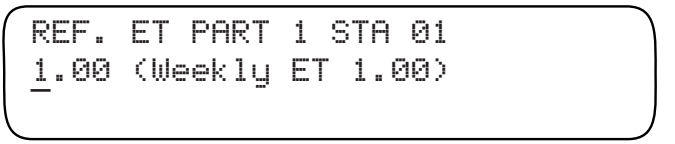


2. The default Soak Time is **30** minutes. To adjust the soak time, turn the **Lower Line** knob (**00–480** minutes).

Set Reference [weekly] ET Value (applies to User With ET mode only)

The **Reference ET** is the weekly ET set in the **User – With ET** mode that your runtimes correspond to. Runtimes will be adjusted up or down automatically depending on whether the actual weekly ET is higher or lower than the Reference ET. The default Reference ET is 1.00 (0.14 inches per day). It is recommended that you set runtimes and the Reference ET value based on the highest weekly ET demand period of the year.

1. Turn the **Upper Line** knob to view the following display:



2. The whole number of the **Reference ET** value is selected by default. To adjust the value from **1 – 3**, turn the **Lower Line** knob.

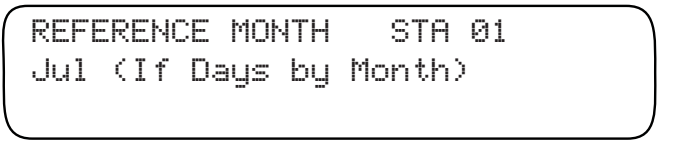
   Note: TheReference ET value is adjustable from 0.50 – 3.99. The whole number is only adjustable to 0 when the decimal number value is .50 or higher.

3. Turn the **Upper Line** knob right to select the decimal number.

4. Turn the **Lower Line** knob to adjust the decimal number value.

   Note: If the station uses the **Days of Week by Month**, watering day mode, the **Reference Month** screen will be displayed as shown below. To adjust this setting, continue at step 5. If not applicable, the **Program Complete** screen will be shown.

5. Turn the **Upper Line** knob to view the following display:



6. Turn the **Lower Line** knob to select the preferred month.

Chapter 5
Support Functions

The **Setup**, **Schedule** and **Station Data** functions enable you to set up an automatic watering schedule designed specifically or each watering zone of the landscape.

The support functions provide enhanced control capabilities of your irrigation system; enabling you to perform various operations such as: program data copy, review, fine-tuning to resolving actual and potential irrigation problems, as well as providing a means of manually operating the irrigation system.

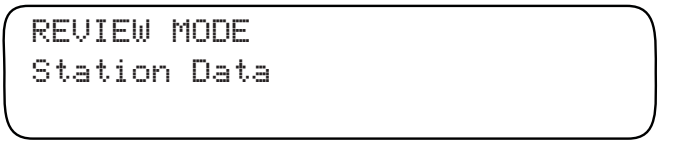
Within this chapter you will find detailed instructions provided for each of the support functions on the following pages:

Function	Page
REVIEW	38
COPY	40
% ADJUST	44
ALERTS	46
FLOW	47
REPORTS	53
RAIN PAUSE	55
MAINTENANCE TIMEOUT	56
ET	57
HELP/INFORMATION	59
MANUAL	62
RUN/OFF	64

Using the Review Function

The **Review** function provides a convenient, at-a-glance overview of all relavent station and flow monitro setup information.

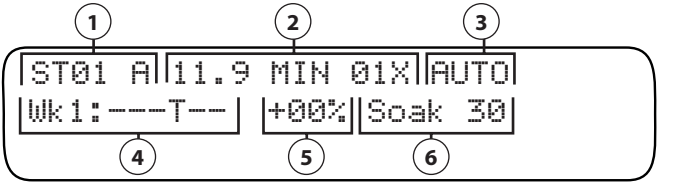
1. Turn the **Function** dial to the REVIEW position. **Review Mode** will be displayed.



2. **Station Data** is selected by default. To select **Flow Data**, turn the **Lower Line** knob. (Refer to **Flow Data Review** on page 37.)

3. Station 1 will be selected by default. To select a differ ent station to review, turn the **Upper Line** knob.

   The review information is displayed in an abbrevieated format that allows the information to viewed in one screen as shown in the example below.



   (**1**) Station number 1 is assigned to watering Schedule A.

   (**2**) The station will water for 11.9 minutes, one cycle per day.

   (**3** Automated by WeathTRAK is the assigned station mode. If the station mode is User-No ET, **User** will be displayed. **UwET** indicates station is assigned to User with ET mode.

   (**4**) The active watering day schedule for Week 1 is Thursday.

   Note: The remainder of the 8-week watering day schedule can be viewed by turning the **Lower Line** knob.

   (**5**) The % Adjust factor is +00%.

   (**6**) Soak time is set for 30 minutes.

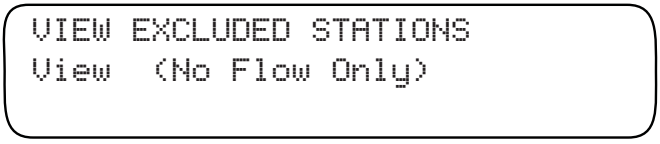
   Note: Additional review information can be acquired for each station by pressing the **Copy** button when the **Fucntion** dial is in the STATION DATA position.

Flow Data Review

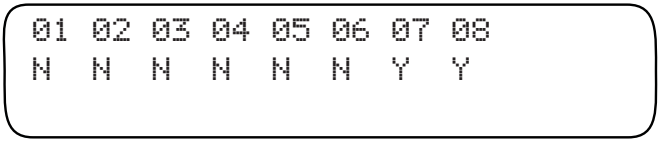
1. With the **Function** dial in the REVIEW position, turn the Lower Line knob to display **Flow Data**.

2. Turning the **Upper Line** knob right displays the Flow Data review screens in the following sequence:
   - Master Valve Status
   - View Excluded Stations
   - Flow Meter Status/Size
   - Flow Meter K and Offset Value
   - Flow Thresholds (GPM)
   - Flow Delay (Minutes)

3. All Flow Review screens are self explanitory, with the exception of View Excluded Stations. The initial screen provides a **Skip**/**View** option. To review the stations excluded from flow monitoring, turn the **Lower Line** knob to select **View**.



4. Turn the **Upper Line** knob right to display the first 8 stations. Continue turning the knob right to display additional stations.



In the example above, station 7 and 8 are excluded from the flow monitoring function.

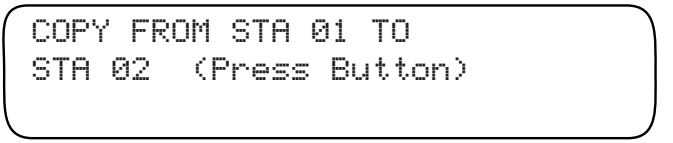
Using the Copy Function

The **Copy** function provides a convenient method of transferring all watering program information from one station to another or to all active stations simultaniously. Minor changes can then be made to each station as needed, greatly simplifying the process of programming several stations with similar watering progam attributes.

The **Copy** function also serves as a means of quickly resetting all user-defined **Setup**, **Schedule** and **Program** settings back to the factory-default values. The default values can be reapplied to selected stations or all stations simultaniously as needed.

Copying Station Information

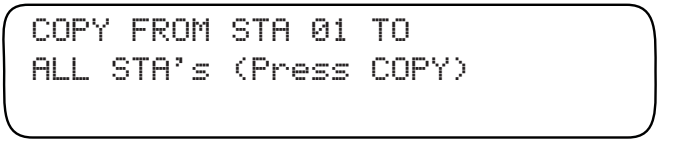
1. Turn the **Function dial** to COPY to view the following display:



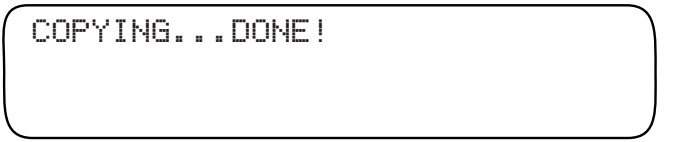
2. Turn the **Upper Line** knob to select the source station number.

   Note: The number of active stations defined in the **Setup** function, determines the number of stations that can be selected.

3. Turn the **Lower Line** knob to select the destination station number. To select **All Stations**, turn the **Lower Line** knob one stop past the highest station number, as shown in the following display:



4. Press and hold the **Copy** button. Release the button when **Copying... Done!** is displayed.



Restoring STATION Default Settings

⚠ **Important: Restoring the STATION defaults erases and resets all user settings for all stations as follows:**

Station Mode - **Automated By WT**
Program Mode - **A**
Use Water Window - **Yes**
Usable Rainfall - **100%**
Sprinkler Type - **Spray Head**
Precipitation Rate - **1.70 In/Hr**
Sprinkler Efficiency - **70%**
Soil Type - **Sandy**
Plant Type - **Cool Season Turf**
Root Depth - **6 Inches**
Microclimate - **Sunny All Day**
Slope Factor - **None/Slight**
Sprinkler Location - **None**

1. Turn the **Function** dial to the COPY position.

```
COPY FROM STA 01
To STA 02  (Press COPY)
```

2. Turn the **Upper Line** knob to select **Copy Station Defaults** as shown in the following example:

```
COPY STATION DEFAULTS TO
To STA 02  (Press Button)
```

3. Turn the **Lower Line** knob to select the station number to be restored. Or, to restore defaults to all stations , turn the **Lower Line** knob to select **All Stations**.

```
COPY STATION DEFAULTS TO
ALL STA's (Press BUTTON)
```

4. Press and hold the **Copy** button. Release the button when **Copying Done** is displayed.

```
COPYING...DONE!
```

Restoring PROGRAM Default Settings

⚠ **Important: Restoring the default Program settings erases and resets all user-defined settings for all programs as follows:**

1st Start Time - **12:00am**
Water Window - **16:00**
2nd Start Type - **High ET**
2nd Start Time - **07:00 pm**
Water Window - **05:00**
Water Day Mode - **Optimized by WT**
Day Excusion - **None**

1. Turn the **Function** dial to the COPY position.

```
COPY FROM STA 01 TO
STA 02  (Press BUTTON)
```

2. Turn the **Upper Line** knob to select **Copy Program Defaults** as shown in the following example:

```
COPY PROGRAM DEFAULTS TO
PGM A  (Press Button)
```

3. Turn the **Lower Line** knob to select the program A, B, C or D) to be restored. Or, to restore defaults to **all programs** simultaneously, turn the **Lower Line** knob to select **All Pgm.**

```
COPY PROGRAM DEFAULTS TO
ALL PGM (Press Button)
```

4. Press and hold the **Copy** button. Release the button when **Copying Done** is displayed.

```
COPYING...DONE!
```

Restoring SETUP Default Settings

⚠ **Important: Restoring the SETUP defaults erases and resets all user-defined settings as follows:**

Adjust Display - **224**	Stack or Overlap - **Stack**
Date - **No change**	Master Valve - **Normally Closed**
Time - **No change**	Pump Start - **Pump On**
Time Zone - **No change**	Run Time Valve Test - **No**
Auto Daylight Savings - **Yes**	Max. Backup ET - **2.00**
Active Stations - **No Change**	Flow Meter Mode - **Off**

1. Turn the **Function** dial to the COPY position.

```
COPY FROM STA 01 TO
STA 02  (Press BUTTON)
```

2. Turn the **Upper Line** knob to select **Copy Setup Defaults.**

```
COPY SETUP DEFAULTS
(Press Button)
```

3. Press and hold the **Copy** button. Release the button when **Copying Done** is displayed.

```
COPYING...DONE!
```

Copy Station Mode

If the controller is initially programmed in the field using the **Auto Station** mode, but is left running in the **User No ET** mode, e.g., for landscape establishment, the Auto Station settings are stored in the controller memory. The Copy Station feature allows stations in **User No ET** mode to be quickly copied to the **Auto Station** mode.

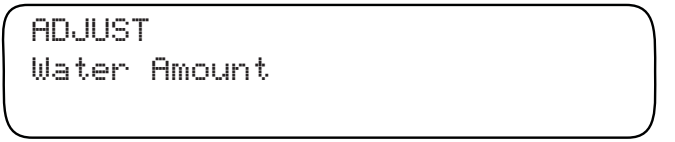
Using the % Adjust Function

The % **Adjust** function allows you to make minor changes in overall station irrigation rate by increasing or decreasing the watering program values proportionally by percentage. Adjustments can be made in 5% increments by Water Amount (station run time and cycles per day), and by Day Frequency / Maximum Allowable Depletion (MAD).

Note: Both adjustment methods can be applied to each active station, however, DF/MAD is only available to stations operating in the Automated by WeatherTRAK mode.

⚠ **Important: A small percentage adjustment can result in a significant change in irrigation rate. Always adjust in 5 or 10% increments, then monitor the condition of the landscape for 7 to 10 days prior to making additional adjustments.**

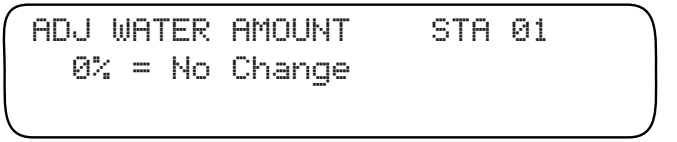
1. Turn the **Function** dial to % ADJUST. The **Water Amount** adjustment option is selected by default.



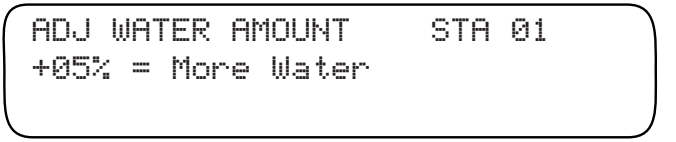
2. To adjust by Water Amount factors, continue below. To adjust by **Day Frequency/MAD**, continue on **page 43**.

% Adjust by Water Amount

1. Turn the **Upper Line** knob to select the station number.



2. The unadjusted water amount value is 0%**.** Turn the **Lower Line** knob right to increase, or left to decrease the value in 5% increments. Maximum adjustment range is +25 to –50%.

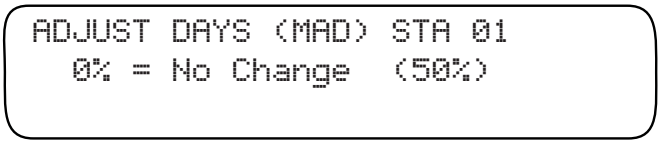


% Adjust by Day Frequency/Maximum Allowable Depletion

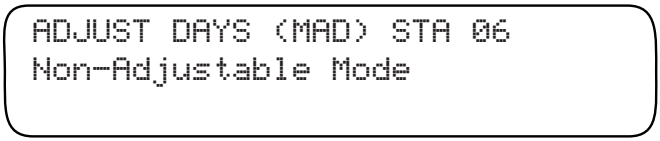
Stations assigned to the **Automated by WeatherTRAK** station mode can be % adjusted by watering Day Frequency/Maximum Allowable Depletion. For example, when establishing new turf, total water application can be increased while decreasing the possibility of runoff. Day Frequency is adjustable from -30% to +30% in 5% increments. The equivalent MAD value will be displayed ranging from 20% to 80% (with **50%** being the standard depletion rate).

1. Turn the **Lower Line** knob to select **Day Frequency/Depletion** adjustment option.

2. Turn the **Upper Line** knob to select the station number.

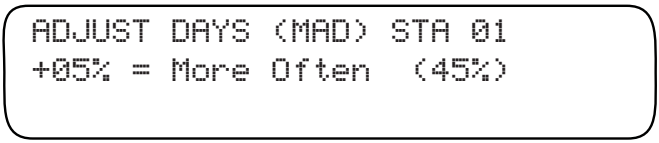


Note: If the selected station number is assigned to a User-defined station mode, the following display will be shown:



3. Turn the **Lower Line** knob right to increase or left to decrease the percent value. Maximum adjustment range is +30% to -30%.

Note: In the following example, the watering day frequency for station 1 has been increased by 5%, which decreased the MAD value to 45%. This change translates to irrigation being permitted when soil moisture content drops to 45% instead of the standard 50% MAD value.



Using the Alerts Function

If a problem, confilict or error occurs with one of the essential Intelli-Sense functions, an Alert prompt will be immediately posted. Selecting **Alerts** function provides a quick overview of the monitored functions, and flags the source of the alert condition.

1. Turn the **Function** dial to the ALERT position.

From the initial Alert display screen, the specific function causing the alert condition will be identified as follows:

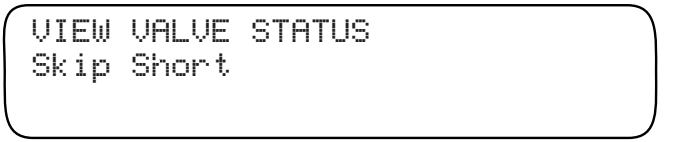
FL - Flow Status
VL - Valve Status
CM - Communication Status
WD - Water Window Status
DY - Water Day Status
HW - Hardware Status
SB - Subscription (ET) Status

2. Turn the **Upper Line** knob to select the function to review. The current status will be displayed, and if additional data is available, a **Skip**/**View** option will be provided.
3. To view the additional data, turn the **Lower Line** knob to select **View**. Turn the **Upper Line** knob to display the data.

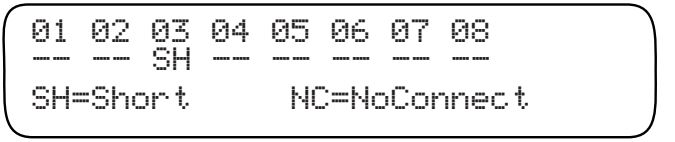
Note: When the condition has been resolved, the Alert display prompt will be removed.

Example: Valve Status Alert

1. With the ALERTS function selected**,** turn the **Upper Line** knob right to select **View Valve Status**.



2. Turn the **Lower Line** knob to select **View**.
3. Turn the **Upper Line** knob right as needed to display the affected station number(s).



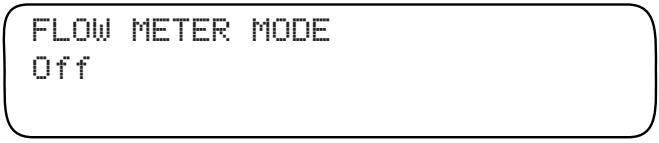
Using the Flow Monitor Function

The Intell-Sense Professional Controller incorporates a precision flow monitorfunction to display and record flow data provided by a compatible Toro TFS Series or Data Industrial IR Series flow sensor. (See flow sensor installation details on page 75.) With the flow sensor properly installed and configured for operation,the Intelli-Sense will continually monitor flow sensor input to record and respond to specific flow conditions including: High-flow, Non-flow, and Leakage. Each flow parameter has an adjustable alert threshold and response delay period. During system operation, any monitored flow condition detected outside the threshold will initiate anAlertresponse. The controller will automatically turn off any affected station(s) or the entire irrigation system as warranted by the monitored condition.

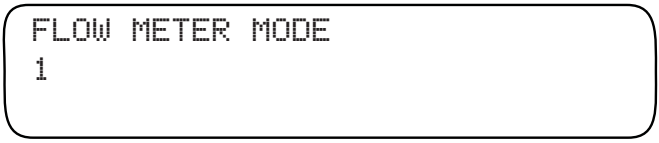
1. Turn the **Function** dial to the FLOWposition. The **Measured Flow** review screen is displayed by default and provides the current system GPM flow rate.

Note: Pressing the **Copy** button while the **Flow** function is selected will prompt the Measured Flow screen to display the current flow rate.

2. Turn the **Upper Line** knob right to select **Flow Meter Mode**.



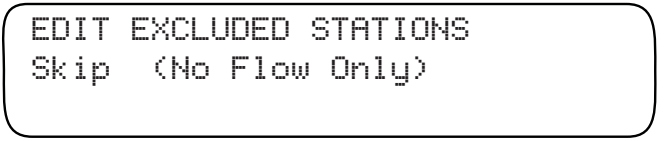
3. By default, the flow monitor function is **Off**. To turn the monitor function **On**, turn the **Lower Line** knob to select **1**.



Set Station Exclusion

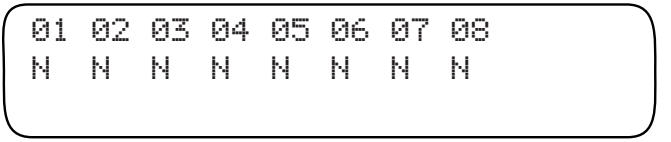
The station exlusion feature enables individual stations to be omitted from the Flow Monitor operations.

1. With the the **Function** dial in FLOW position, turn the **Upper Line** knob right to select **Edit Excluded Stations**.



2. Turn the **Lower Line** knob to change **Skip** to **Edit**.

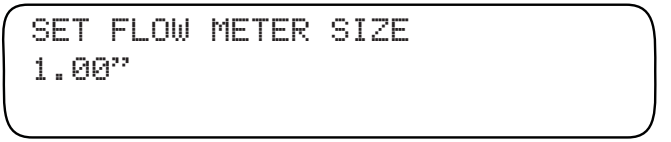
3. Turn the **Upper Line** knob to display the first eight station numbers in sequence.



4. By default, no stations are excluded (indicated by **N**) and station **01** is selected. To exclude the selected station, turn the **Lower Line** knob to change **N** to **Y** (**Yes**). To select another station number, turn the **Upper Line** knob. Repeat as needed for all station numbers.

Set Flow Meter Size

1. With the the **Function** dial in FLOW position, turn the **Upper Line** knob right to select **Set Flow Meter Size**

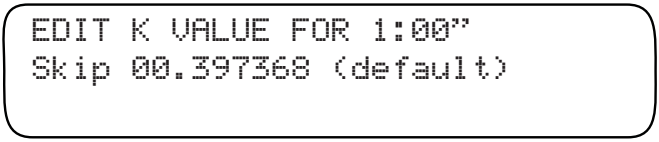


2. Turn the **Lower Line** knob to select the actual flow sensor size from the following options: 1.00”, 1.25”, 1.50”, 2.00”, 3.00”, 4.00” and Insert Type (sizes < 1” or > 4”).

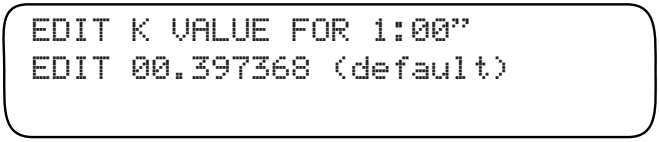
Edit Flow Sensor K Value and Offset

A default flow sensor K value, based on the flow sensor size, is automatically entered. Refer to the manufacturer's recommended K value and edit accordingly.

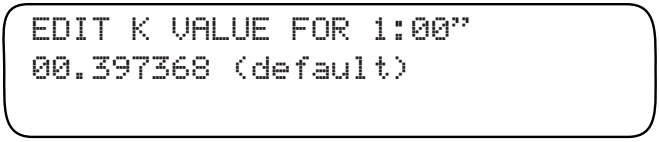
1. With the the **Function** dial in FLOW position, turn the **Upper Line** knob right to select **Edit K Value.**



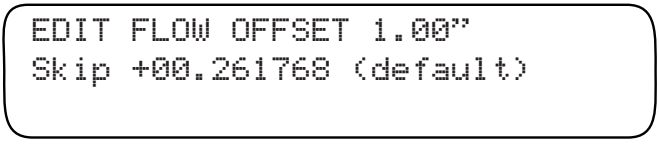
2. Turn the **Lower Line** knob to change **Skip** to **Edit**.



3. Turn the **Lower Line** knob to select the edit screen. The first digit in sequence will be selected. To adjust the digit, turn the **Lower Line** knob. To advance to the next digit, turn the **Upper Line** knob. Repeat this process for the remaining digits to be edited.



4. Turn the **Upper Line** knob right to select **Edit Flow Offset**.



5. Edit the **Flow Offset** value in the same manner as **K Value**.

Set Threshold and Delay Values

The threshold value is the defined limit for maximum, minimum and no-flow conditions. If monitored flow exceeds a threshold, an Alert is posted, and all remaining watering operations suspended or modified untl the alert is cleared or problem resolved.

The delay period provides a 1- to 6-minute buffer between an exceeded threshold and the controller response. Increasing the delay period, decreases controller sensitivity to temporary or minor fluctuations.

Controller Response: Controller response to an exceeded threshold is based on the selected operating mode as follows:

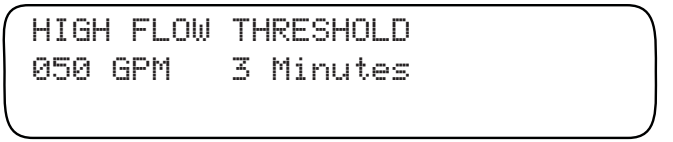
Stack Mode – The operating station will turn off, and the next station in sequence will turn on. If the condition persists, all irrigation will be terminated and an alert posted. If the flow normalizes, the controller will continue the watering cycle. Bypassed stations will be indicated and given first priority in the next schedueld watering cycle.

Overlap Mode – The system will shut down. After a short delay, the master valve will be opened and flow measured. If the condition persistes, all irrigation will be terminated and an alert posted. If flow normalizes, watering will resume one station at a time. Each station will be flow monitored and bypassed if the threshold is exceeded. Bypassed stations will be indicated and given first priority in the next schedueld watering cycle.

Setting the High Flow Threshold

Note: The High Flow threshold should be set approximately 10–15% **higher** than the expected flow in any program configuration to prevent a false alert response.

1. With the the **Function** dial in FLOW position, turn the **Upper Line** knob right to select **High Flow Threshold**.



2. The default threshold will be displayed. To adjust, turn the **Lower Line** knob. The value is adjustable from **Off –30** in one-GPM increments, or **30–995** in five-GPM increments.

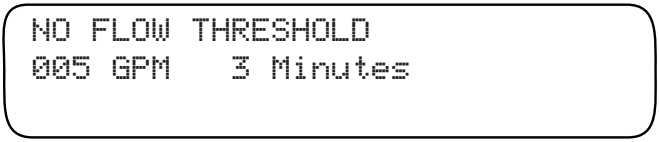
3. Turn the **Upper Line** knob (right) to select **High Flow Delay**.

4. Turn the **Lower Line** knob to adjust the delay minutes (1–6).

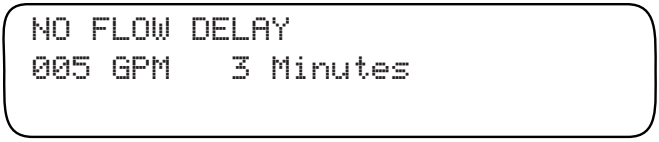
Setting the No Flow Threshold

Note: To prevent a false alert response, the No Flow threshold should be set 10–15% **lower** than the expected flow in any program configuration.

1. Turn the **Upper Line** knob (right) to select **No Flow Threshold**.



2. The default threshold will be displayed. To adjust, turn the **Lower Line** knob. The value is adjustable from Off –30 in one-GPM increments, or 30–995 in five-GPM increments.
3. Turn the **Upper Line** knob (right) to select **No Flow Delay**.

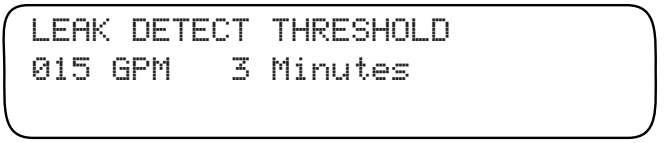


4. Turn the **Lower Line** knob to adjust the delay period (1–6 minutes).

Setting the Leak Detection Threshold

Note: Flow is monitored during non-irrigation periods (outside of scheduled irrigation or during soak periods) to detect leaks. If flow is monitored above the Leak Detect threshold, the master valve will be shut off and an alert will be posted. The alert condition must be cleared to resume operation.

1. Turn the **Upper Line** knob (right) to select **Leak Detect Threshold**.



2. The default threshold will be displayed. To adjust, turn the **Lower Line** knob. The value is adjustable from Off –30 in one-GPM increments, or 30–995 in five-GPM increments.
3. Turn the **Upper Line** knob (right) to select **Leak Detect Delay**.

4. Turn the **Lower Line** knob to adjust the delay period (1–6 minutes).

Note: If Manual Irrigation or Quick Couplers are used, the Leak Detect should be set above the expected flow for these operations.

Using the Reports Function

The Reports function provides cumulative station run time and flow data, selectable within the following specified reference formats:

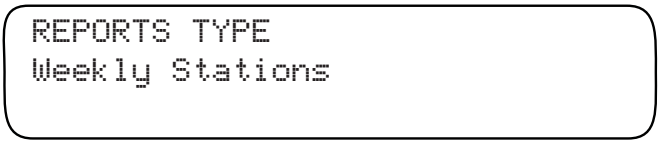
Weekly Stations - Run time in hours and minutes per station per week.

Monthly Stations – Run time in hours and minutes per station per month.

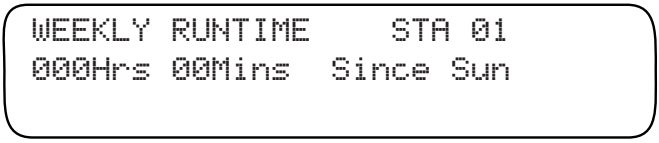
Flow – Total flow in gallons per day, week, month, specific day range and specific prior date.

Weekly Stations Report

1. Turn the **Function** dial to the REPORTS position.

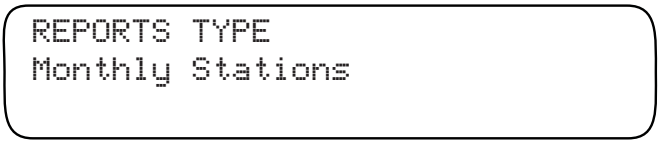


2. **Weekly Stations** is selected by default.
3. Turn the **Upper Line** knob right on stop to display cumulative run time for station 1. To change the station number, turn the **Upper Line** knob to the right.



Monthly Stations Report

1. Turn the **Lower Line** knob to select **Monthly Stations**.

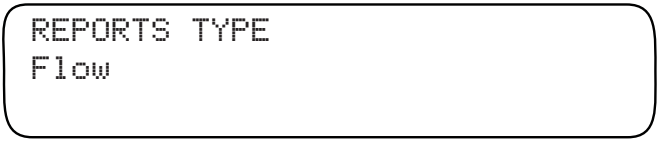


3. Turn the **Upper Line** knob right on stop to display **Monthly Runtime** for station 01 in January.

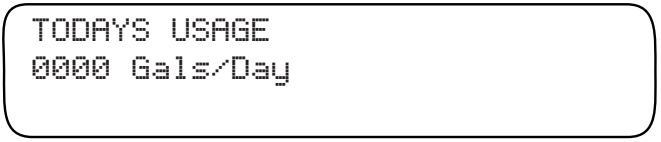
4. Turn the **Lower Line** knob right to change the month to review. Turn the **Upper Line** knob to change the day to review.

Flow Report

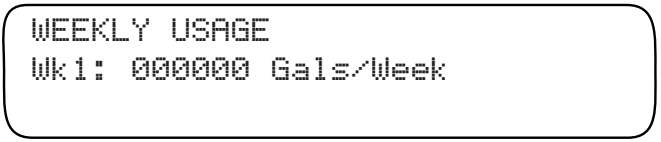
1. Turn the **Lower Line** knob to select the **Flow** report option.



2. Turn the **Upper Line** knob right on stop to display **Todays Usage**.



3. Turn the **Upper Line** knob one stop to select **Weekly Usage**.



4. **Week 1** is selected by default. Turn the **Lower Line** knob right to review usage for weeks **2–8**.

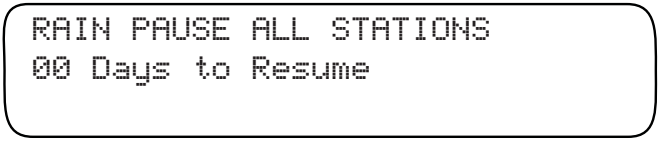
   Note: Week 1 is the current week starting Sunday at Midnight (12:00am).

5. Turn the **Upper Line** knob to advance the report option to **MONTHLY USAGE** and **USAGE FOR LAST XX Days**. The **Lower Lin**e knob will select the Month (**MONTHLY USAGE**) or the range of days (**USAGE FOR LAST XX Days**) to review.

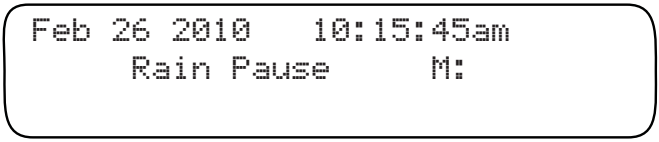
Using the Rain Pause Function

The Rain Pause function enables all automatic watering operations to be easily suspended from 1 to 200 days. At the end of the selected delay period, the controller resumes automatic operation. All other functions, including programming, manual operations and ET updates are available while the Rain Pause mode is active.

1. Turn the **Function** dial to select **Rain Pause.**



2. Turn the **Lower Line** knob to select the number of days to pause operation.
3. Turn the **Function** dial to the **Run** position.

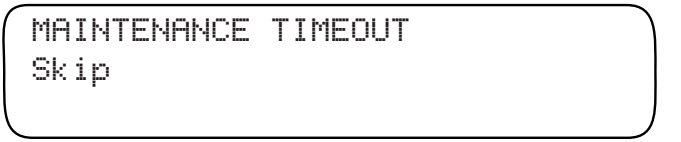


4. The display will indicate **Rain Pause** until automatic operation resumes at the end of the delay period. To terminate the Rain Pause mode at any time, turn the **Function** dial to select **Rain Pause**.
5. Turn the **Lower Line** knob to select **00** days to resume.
6. Turn the **Function** dial back to the **Run** position.

Using the Maintenance Timeout Function

The MaintenanceTimeout feature enables a time period ranging from 0.5 to 8.0 hours to be set, then selectedas required. During the timeout period, the leak detection function is disabled and the normally-closed master valve is energized. A typical use of the Maintenance Timout function would be to facilitate quick-coupler irrigation.

1. Turn the **Function** dial to the blank position, located between **Flow** and **Reports**.

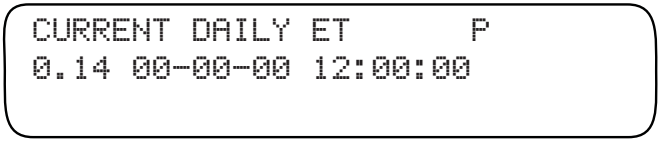


2. Turn the **Lower Line** dial to **Edit**.
3. Turn the **Upper Line** dial one click.
4. Turn the **Lower Line** dial to **ON**.
5. Turn the **Upper Line** dial to highlight **Time**.
6. Turn the **Lower Line** dial to set timeout duration (0.5–8.0 hours).

Using the ET Function

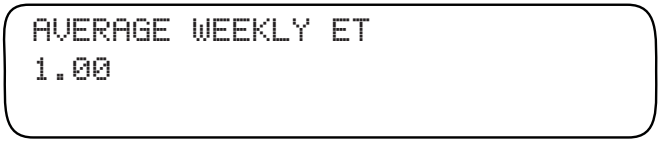
The screens provided within in the ET function enable the current daily and weekly ET values to be reviewed, and the Kc value of custom plants and turf to be defined.

1. Turn the **Function** dial to the ET position. The **Current Daily ET** value recievied from the ET Everywhere service will be displayed with the download date and time stamp.



Note: If the letter **P** is displayed, an updated daily ET value is currently pending download. A letter **I** indicates that incremental ET data has been downloaded prior to the scheduled download time due to an extreme change in weather and conditions resulting ET data.

2. Turn the **Upper Line** dial right to display **Average Weekly ET**. The numeric value shown is the average daily ET value compiled from the previous seven days.



Edit Custom Plant Kc Value

1. With the **Function** dial in the ET position, turn the **Upper Line** dial right to select the **Custom Kc** screen.

2. Plant **A** is selected by default. To select Plant **B**, turn the **Upper Line** knob.
3. A Kc value of **1.0** is selected by default. Turn the lower line knob to adjust the value between 0.10 to 1.20.

Note: Most common crop coefficient (Kc) values can be found on the Irrigation Association web site at: www.irrigation.org

Edit Custom Turf Kc Value

1. With the **Function** dial in the **ET** position, turn the **Upper Line** dial right to select the **Custom Kc Turf** screen.

2. **January** selected by default. To change the month setting, turn the **Upper Line** knob.
3. A Kc value of **1.0** is selected by default. Turn the **Lower Line** knob to adjust the value between 0.10 to 1.20.

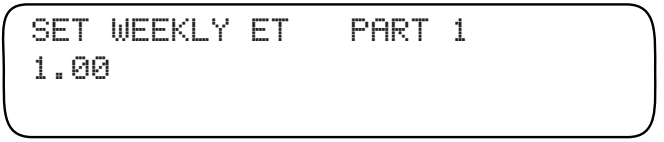
   Note: Most common crop coefficient (Kc) values can be found on the Irrigation Association web site at: www.irrigation.org
4. Repeat steps 2 and 3 for each remaining month as required.

Set Weekly ET

The weekly ET value can be temporarily adjusted from 0.01 to 3.99 in the Set Weekly ET screen. This feature enables current station program values to be changed and reviewed using an ET value other than downloaded data.

Note: Only stations with an assigned ET based station mode will be modified. The adjusted ET value will be replaced by the next scheduled ET Everywhere service download.

1. With the **Function** dial in the ET position, turn the **Upper Line** dial right to select the **Set Weekly ET** screen.



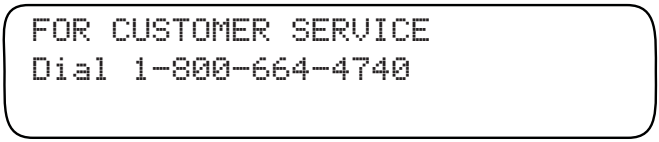
2. Turn the **Lower Line** knob to adjust the whole number value (1–3).
3. Turn the **Upper Line** knob to select the decimel number value.
4. Turn the **Lower Line** knob to adjust the decimel number value (01–99).

Using the Help/Information Function

The screens provided in the Help/Information function provide the detailed system information required for ET Everywhere service setup and status information of various controller operations and support functions.

Help and Information Screen Overveiw

1. Turn the **Function** dial to the HELP/INFO position. The Toro Customer Service informaton screen is displayed by default.



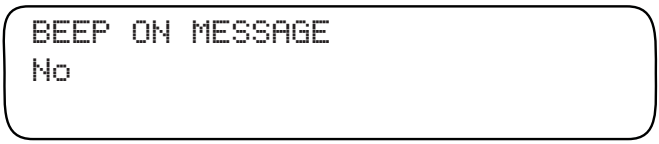
The remaining Help/Info screens are selected in the following sequence by turning the **Upper Line** knob:

***Serial Number**	**Set Audible Message Alert**
***WeatherTRAK Version**	**Rain Service Status**
***View Phase Integrity**	**View Group Number**
***Lock Phase**	**Days Since Last ET Update**
***ET Service Setup Data**	**Current Depletion Rate**
***ET Service Activation Status**	**Run Time Valve Test Results**

* **Note:** The information provided on these screens is required for ET Everywhere service activation. During the setup procedure, the WeatherTRAK customer service representative will assist you in selecting and obtaining specific information from each screen.

Set Audible Message Alert

1. With the **Function** dial in the HELP/INFO position, turn the **UpperLine** dial to select the **Beep On Message** screen.



2. **No** is selected by **default.** To turn the audible alert feature on, turn the **Lower Line** knob to select **Yes**.

Rain Service

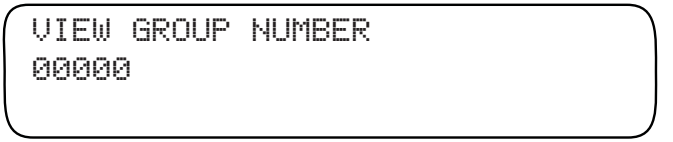
The Rain Service feature is offered by WeatherTRAK to monitor rainfall within your location and terminate automatic watering in the event of rain.

1. With the **Function** dial in the HELP/INFO position, turn the **Upper Line** knob to select the **Beep On Message** screen.

Note: Rain Service is inactive by default. For detailed information regarding Rain Service activation, contact a WeatherTRAK Customer Service at 1-800-362-8774.

View Group Number

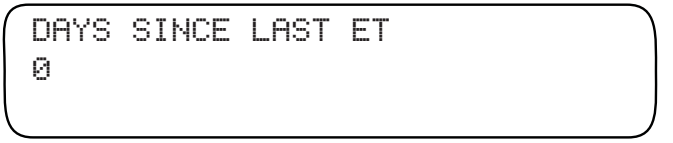
1. With the **Function** dial in the HELP/INFO position, turn the **Upper Line** knob to select the **View Group Number** screen.



The Group number is a function of the Rain Sevice feature and is not applicable unless the service is active. See **Rain Service** above.

Days Since Last ET

1. With the **Function** dial in the HELP/INFO position, turn the **Upper Line** knob to select the **Days Since Last ET** screen.

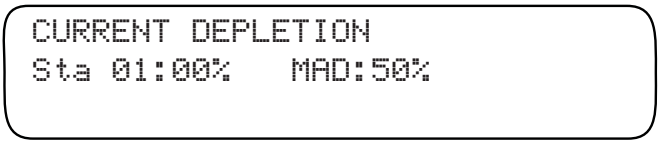


Note: This reference screen indicates how many days have elapsed since the controller last received ET Everywhere service data, and is not applicable unless the ET Everywhere service is active.

Current Depletion

The Current Depletion reveiw screen provides the actual depletion value and the current MAD value for each station. An additional feature provided within this screen enables the actual depletion value to be easily reset to the current MAD value.

1. With the **Function** dial in the HELP/INFO position**,** turn the **Upper Line** knob to select the **Curent Depletion** screen.

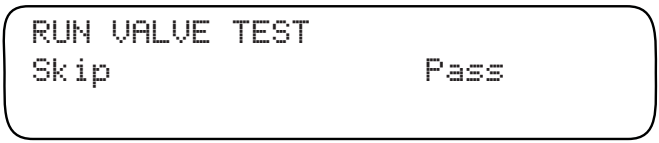


2. Station 1 is selected by default. Turn the **Lower Line** knob to change the station number.
3. The MAD value shown represents the depletion value that is applied in the % **Adjust > Day Frequency/Depletion** screen. To reset the actual depletion value to the current MAD value, press the **Copy** button.

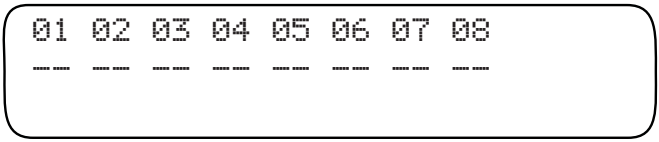
Run Valve Test

The valve test feature provides a quick status check of all active station outputs including the master valve. Pass/Fail prompt will be displayed at the conclusion of the test.

1. With the **Function** dial in the HELP/INFO position**,** turn the **Upper Line** knob to select the **Run Valve Test** screen.



3. **Skip** is selected by **default.** To view the test results, turn the **Lower Line** knob to select **View**. Turn the **Upper Line** knob to view the test results for stations 1–8.



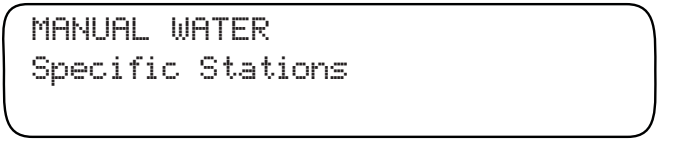
4. Press the **Copy** button to initiate the test. Turn the **Upper Line** knob to advance through the station count. Upon completion, a **Pass/Fail** prompt will be displayed.

Using the Manual Watering Function

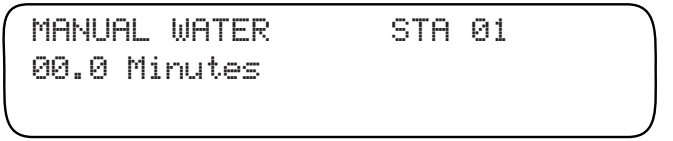
The Manual function enable of all stations (in sequence) or individual station(s) to be manually operated at any time. Manual operation lasts for a specified number of minutes and starts immediately, whether or not the current day is a scheduled watering day. Only one station can be on at a time when operating manually.

Manually Operate Specific Stations

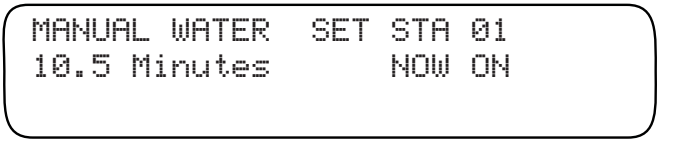
1. Turn the **Function** dial to the **MANUAL** position. Specific Stations option will be displayed by default. (See page 63 for All Stations manual operation.)



2. Turn the **Upper Line** knob to change the station number.



3. Turn the **Lower Line** knob to select manual operating time from **1 – 99** minutes in one-minute increments.



The station cycle time will count down in 10th's of a minute. The station will shut off when the run time counts down (or is adjusted down) to **00.0** minutes.

4. Repeat steps 2 and 3 to select additional stations for manual operation. Each station placed in queue will operate one at a time in numerical sequence as the preceding station times out and shuts off.

Note: To terminate operation, either turn the **Lower Line** knob to select **00.0** run time, or turn the **Function** dial to the **OFF** position. Pause until the station turns off (5 seconds) before changing **Function** dial position.

Manually Operate All Stations

1. Turn the **Function Selector** knob to **MANUAL**.

2. Turn the **Lower Line** knob to view the following display:

```
MANUAL WATER
All Stations
```

3. Turn the **Upper Line** knob to select the following display:

```
MANUAL WATER ALL STATION
00.0 Minutes
```

4. Turn the **Lower Line** knob to select manual operating time from **01 – 99** minutes in one-minute increments.

```
MANUAL WATER ALL STATION
05.0 Minutes   STA 01 ON
```

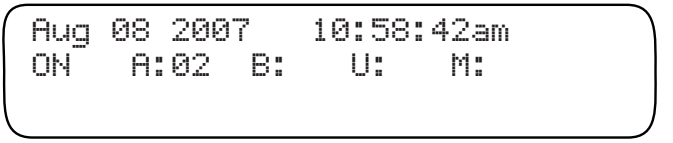
The station runtime will count down in 10th's of a minute. The station will shut off when the runtime counts down (or is adjusted down) to 00.0 minutes. Each station will operate in sequence for the selected runtime.

Note: To terminate operation, either reduce the station runtime to **00.0** or turn the **Function Selector** knob momentarily to the **OFF** position.

The Run Function

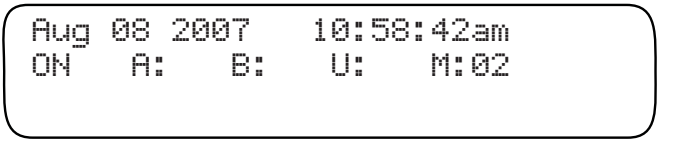
RUN is the Function dial position for normal controller operations. However, automatic controller operation will occur when the Function Selector knob is in any position other than **OFF**.

1. Turn the **Function Selector** knob to **RUN** to view the following display (example):



The current **date** and **time** will be displayed on the upper line. The lower line will indicate any station number, i.e., station Station **02** in Program **A**, is currently operating automatically.

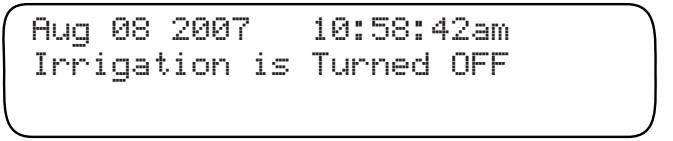
If Station **02** was running manually the display would be shown:



Note: When operation of the master valve/ pump start circuit is enabled within the Setup function, it will be energized in conjunction with any watering activity. A separate indication for master valve/pump operation is not shown on the display.

The Off Function

All controller output will be terminated and remain off while the function dial is in the OFF position. All other controller operations, including ET data download, will be uninterrupted.



Appendix A
Troubleshooting Guide

The landscape is too dry.

1. Turn the **Function** dial to ADJUST. .
2. Turn the **Upper Line** knob to select a station.
3. Turn **Lower Line** knob to adjust +5% and watch for 7 to 10 days.
4. If your landscape is still too dry, increase 5% each week until stress is eliminated. This is the optimal level.

The landscape is too wet.

1. Turn the **Function** dial to ADJUST.
2. Turn the **Upper Line** knob to select a station.
3. Turn the **Lower Line** knob to adjust -10% and watch your landscape for 7 to 10 days.
4. If your landscape is still too wet, decrease 5% to 10% each week until you see minor stress in you landscape.
5. When you see minor stress in your landscape, increase 5% to set program at optimal level.

The Alert tone continues to turn on.

1. Turn the **Function** dial to HELP/INFO.
2. Turn the **Upper Line** knob select **BEEP on MESSAGE?**
3. Turn the **Lower Line** knob to select **No**.
4. Turn the **Function Selector** knob to **RUN**.

The display is blank.

1. Power to the controller has been disconnected, either by a blown fuse or at the AC power source circuit breaker panel. Check fuse condition, referring to the procedure on **page 76**. Check the circuit breaker at the power source and reset as necessary.

2. If the display does not return, contact Toro Customer Support at **1-800-664-4740**.

The controller programs correctly but does not operate automatically.

1. Confirm the controller clock is synchronized with the current time and date. If the controller clock is wrong, watering may not occur as expected.

2. If **Rain Switch** is displayed, the Rain Sensor circuit has placed automatic operation on hold. If a Rain Sensor is not installed, confirm the **Sensor** switch is in the **Bypass** position. Check the Sensor wiring terminals to verify installation of a jumper wire connecting the terminals.

The ADJUST Function appears to be ineffective.

1. Make sure the date and time settings are correct.

2. Turn the **Function** dial to **REVIEW**.

   Changes made within the **Adjust** function may be very subtle, resulting in minor changes to the cycle time or number of cycles, or it may be more significant depending on the percent adjustment. If it is currently Wednesday or later in the week when reviewing the schedule, the affect of the adjustment may not be evident in the Week 1 display. You should see the effect of **Adjust** in the Watering Day schedules of Weeks 2 – 8.

Week 1 of the watering day schedule appears incomplete.

1. The days prior to installation will not be shown in the Week 1 schedule. The controller shows what days have irrigated or it anticipates what days will irrigate if the weather remains as it is today. If the controller is installed on a Friday, there will be no irrigation days shown prior to Friday, which may result in no irrigation days at all for Week 1.

2. Turn the **Lower Line** knob to see irrigation day schedules for Week 2 – 8. The irrigation days will display a pattern as you step through the subsequent displays.

The REVIEW display indicates 99+ minutes.

1. Since the displayed cycle time is limited to two digits, 99+ is shown when the total programmed cycle time is greater than 99 minutes. This display does not indicate a controller malfunction.

Notes

Appendix B
Glossary of Terms

Group Number – This is a code number provided by the ET Everywhere service to the Intelli-Sense controller at the time of activation. The link enables the ET Everywhere service to communicate conditions relative to controllers in locations where irrigation regulation programs are in effect. This code will only be assigned if the user is a participant in the program.

High ET Start Time – In the event of a very high ET rate, the controller will try to irrigate enough to satisfy the plants' needs. If the controller cannot accomplish this within the allotted water window time frame, an additional irrigation start time will be initiated to fulfill the watering requirements. The High ET Start Time is when the additional watering cycle start can occur.

Maximum Active Stations – This number represents the actual number of functional stations. For example, if 10 stations have valves connected, but two stations are for future system use and are currently non-functional, the maximum active station number would be eight. Selecting a higher number of stations than actually used can cause the Water Window duration to be exceeded, resulting in false condition alerts. Setting a lower number than actual will prevent some of the stations from operating.

Maximum Backup ET Value – This value is the highest ET rate expected for the year based on geographic and average weather conditions. Backup ET is a fail-safe measure used only if the daily ET Everywhere service data transmission has not been received for four consecutive days. The Backup ET value will be automatically adjusted to compensate for the current calendar month in which the interruption occurs.

Microzone Number – This value is transmitted by the ET Everywhere service at the time of activation to establish specific latitude and longitude coordinates. This process enables the ET Everywhere service to provide localized ET/weather data.

Phase Integrity Data – This reference value is used exclusively by the ET Everywhere service to determine the broadcast integrity or signal strength of three wireless network communication carriers used to broadcast the ET Everywhere service data. The highest displayed signal phase value is used for initial service activation.

Phase Lock – The Intelli-Sense receives daily weather updates from three different paging carriers. At the time of ET Everywhere service activation, the carrier with the highest signal strength is selected to ensure the best data reception and to expedite the activation process. After initial activation, the Intelli-Sense receives all carriers each night to provide redundancy for data reception.

Rain Service – This is an optional service available in a limited number of areas that enables the controller to receive rainfall information to adjust the program accordingly. Rain Service data accounts for local reported rainfall and includes it in the soil moisture depletion calculations.

Stacking/Overlap Mode – When Stacking mode selected, the controller is constrained to operate one program (or station) at a time.
In the Overlap mode, watering progams operate independently, enabling up to four programs (or stations) to operate simultaneously, depending on how the schedules may overlap. The primary factor to consider before using the Overlap mode is if the irrigation supply can handle the combined demand of simultaneous multi-program operation.

Water District Number – If you are an active participant in a water agency program, you will be given a water control district identification number to enter during the ET Everywhere service activation. This five-digit code will enable the controller to be automatically notified of local agency requirements and/or restrictions.

Water Window – The Water Window is a selectable time frame ranging from 6 hours minimum to 23 hours and 59 minutes maximum per scheduled watering day. The Water Window start time marks the beginning of the irrigation for the day. All stations programmed to operate on the scheduled watering day, must run to completion before the end of the Water Window occurs.

Appendix C
Installation Procedures

Selecting the Installation Site

The Intelli-Sense controller is designed for most professionally installed applications where outdoor installation is required.

For optimum controller use and perfomance and protection, use the following guidelines when selecting an installation site:

- **Line-of-sight**
  If possible locate the controller where a majority of the landscape can be viewed from one location.
- **Proximity to AC power source**
  Long runs of both wire and conduit can add costs to your project. In some applications, the accessibility to AC power may dictate the location of the controller.
- **Dedicated AC power source**
  If possible, the controller should be connected to a dedicated 120 VAC 15A circuit.
- **Accessability**
  The controller should be easily accessable for installation setup operation and system maintenance, yet secure from public access.
- **Exposure**
  Avoid locating the controller where it will be exposed to irrigation spray, afternoon sun, wind and snow.
- **Communication interference**
  Avoid locating the controller adjacent to large power transformers or above ground power vaults where electromagnetic energy could impair reception.

Mounting the Controller

1. Open the cabinet door and TM mounting plate. Position the controller on the wall and mark the top mounting hole location.
2. Install the top mounting screw leaving the screw head about 1/8" (3 mm) from the wall.

   Note: When installing the controller on masonry or dry wall, install appropriate screw anchors.
3. Hang the controller on the screw. Install the lower mounting screw and tighten both screws to ensure the controller is securely fastened.

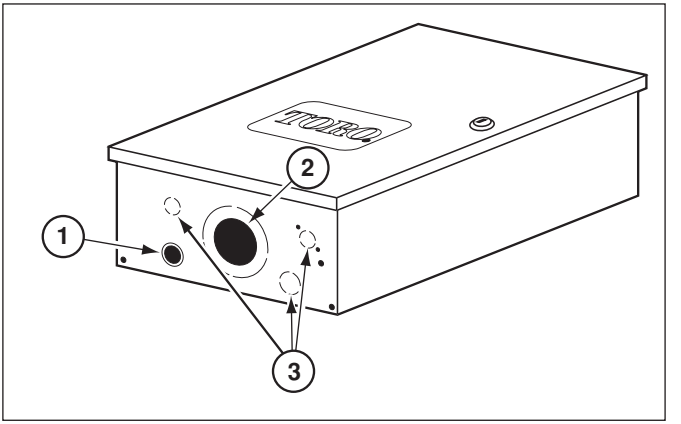
Installing Conduit

Note: Electrical conduit and adapters are not supplied with the controller but may be required for installation in your area. Check local electrical codes and install conduit according to requirements.

1. Remove terminal strip cover located below the transformer. Install conduit from the circuit breaker panel to the controller cabinet using the 1/2" (13 mm) thru-hole or 3/4" (19 mm) conduit knockout.

2. For field wiring, either 2" (51 mm) or 3" (75 mm) conduit can be installed. For 3" (75 mm) conduit, remove the knockout ring provided to increase the hole size. Sufficient space is provided to enable either a hex nut or star nut to be installed on the conduit fitting.

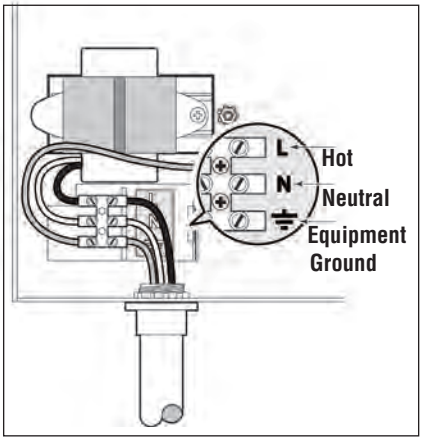
3. Auxiliary wiring conduit knockouts (use as preferred).



Connecting the Power Wires

⚠ WARNING: All electrical components must meet applicable national and local electrical codes including installation by qualified personnel. These codes may require a means in the fixed wiring of disconnecting AC power having a contact separation of at least 0.120" (3mm) in the line and neutral poles. The wire used for connection to the controller must have insulation rated at 105°C minimum. Do not connect the controller to one phase of a 3-phase power source. Ensure the AC power source is OFF prior to connecting to the controller.

1. Ensure the power is disconnected at the source.
2. Route the AC power and equipment ground wires through electrical conduit to the controller.
3. Remove the wiring access panel located below the transformer.
4. Using a small screwdriver, secure wires as follows: hot to **L**, neutral to **N**, and equipment ground to ⏚.
5. Reinstall the cover plate.
6. Apply power to controller.



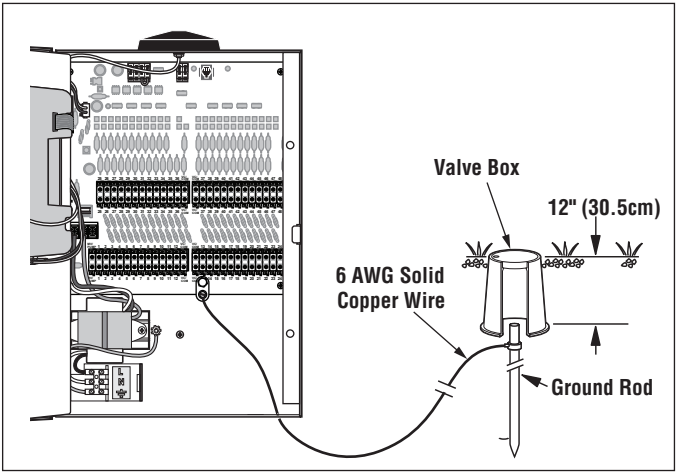
Connecting an Earth Ground Source

⚠ Caution: Warranty may be void if the controller is not properly grounded to an earth ground device.

1. Install a copper-clad ground device; i.e., 8′ (2,5m) ground rod into well moistened soil. The top of the rod buied at least 12″ (30,5cm) below grade.
2. Using a Cad-weld™ (or equivalent) attachment method, connect a 6 AWG (10mm²) solid copper wire to the ground device and route to the controller in the most direct path. (Wire bends should be minimal and not be less than 8″ (20,3cm) in radius).
3. Route ground wire through cabinet base using 1/4″ (6mm) access hole provided.

(continued)

4. Insert the ground wire into the copper ground lug and tighten securely.



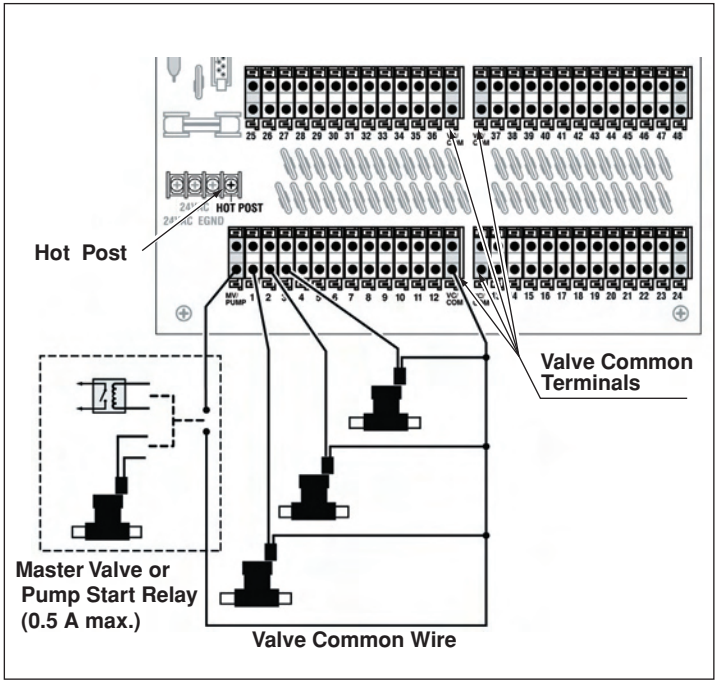
Connecting the Station Wires

Note: Using 18 AWG (or larger) irrigation valve connection cable or wire is recommended for all field wire connections.

1. To provide a valve common connection, interconnect one control wire (generally white) to either lead of each valve solenoid.
2. Connect a separate control wire to the remaining lead of each valve solenoid. For reference, note the wire color used for each valve connection, it's corresponding watering zone and the intended station number.
3. If a master valve or pump start relay is used, make this connection in the same manner.
4. Route the control wires into the controller cabinet through the large opening provided or through conduit if installed.
5. Cut wires back as necessary to provide an appropriate length for connection. Strip 3/8"(10mm) insulation from each wire.

Note: Each field wire connection block provides 12 station outputs (black) and one common output (green). The lower left connection block provides one master valve/pump start relay output (blue). To connect wire, push orange tab in, insert wire, then release. Pull lightly on wire to confirm retention.

6. Connect common wire(s) first. To momentarily operate a valve for identification and/or functional test, touch it's control wire to the 24 VAC Hot Post. When operation has been confirmed, connect the wire to the preferred station terminal.

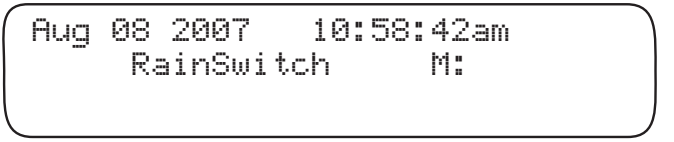


⚠ Caution: The controller must not be connected directly to a pump or other high current-draw equipment. A 24 VAC, 0.5A (max.) relay must be used to facilitate the connection. Failure to comply can result in severe controller damage.

Toro Rain Sensor Connection

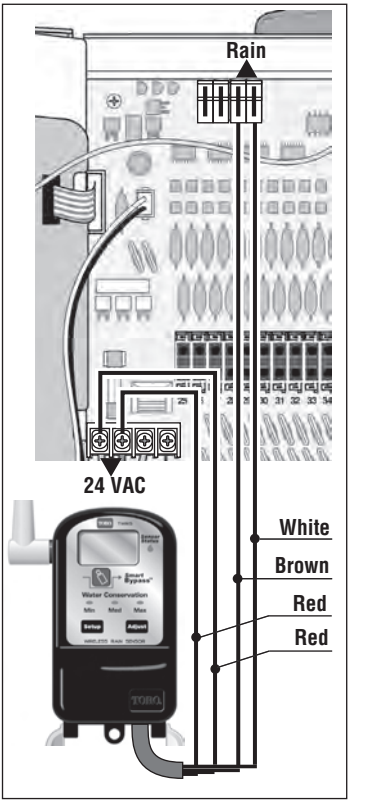
Installation of the Toro TWRS rain sensor or TWFRS rain/freeze sensor sensor is recommend for best results.

Note: If a rain sensor is **NOT** connected, the **Sensor** switch must be in the **BYPASS** position. If the **Sensor** switch is placed in the **ACTIVE** position without a rain sensor connection, the controller will be placed in a rain hold mode, and all operation will be suspended. The following screen will be displayed:



1. Remove one of the auxiliary wiring access plugs rom the bottom of the cabinet and insert the rain sensor connection cable.
2. Connect the Brown and White wires to the Ran Sensor terminal block as follows: Lift the terminal block lever, insert the bare wire, then secure the wire by pushing the lever down.
3. Connect the Red 24 VAC wires to the 24 VAC transformer wire terminal block.
4. Refer to rain sensor user guide for complete setup and operating information.

   Note: When the rain sensor is active, the screen shown above will be displayed. To bypass rain sensor operation at any time, place the Sensor switch in the **Bypass** position.

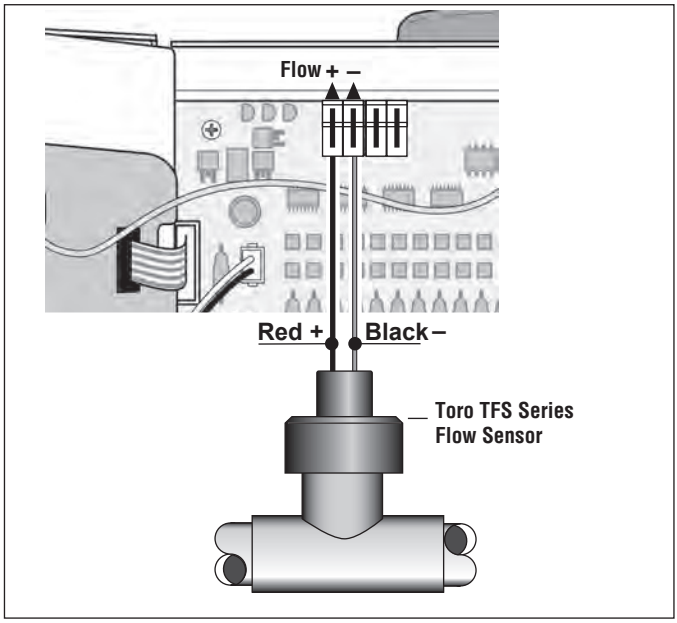


Flow Sensor Connection

The Intelli-Sense Commercial Controller is designed for use with a Toro TFS or Data Industrial IR series flow sensor. The flow sensor must be installed and connected in compliance with the instructions provided with the device.

⚠ Important: Refer to the sensor manufacturer's recommended communication cable size and type. All cable wire splices must be watertight, with absolutely no path to ground or contact between conductors. Using an epoxy-type wire splicing method is recommended.

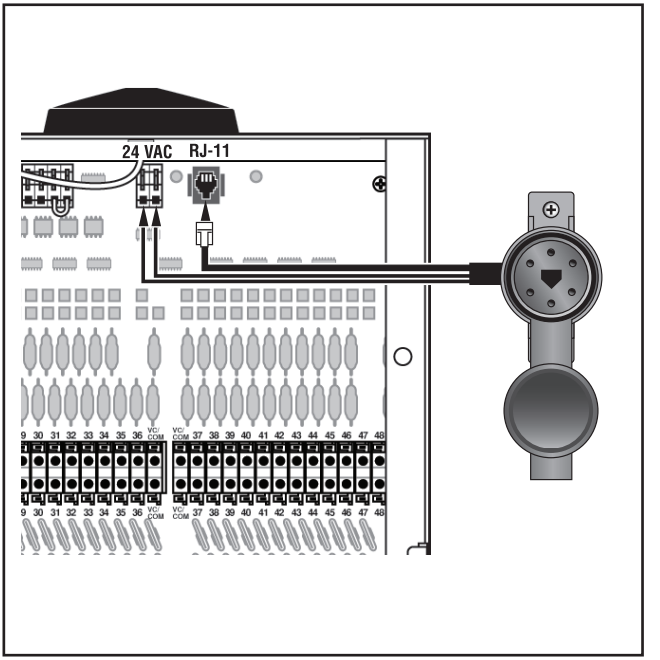
1. Remove one of the auxiliary wiring access plugs from the bottom of the cabinet and insert the flow sensor connection cable.
2. Route the flow sensor cable to the sensor terminal block and connect the wires as follows: Lift the terminal block lever, insert the bare wire, then secure the wire by pushing the lever down. Connect **Black (–)** wire to the **Flow (–)** terminal and the **Red (+)** wire to the **Flow (+)** terminal.
3. Refer to page 49 for flow sensor/monitor setup information.



Toro TMR-1 Handheld Remote Connection

The Intelli-Sense TIS-PRO is equipped for quick connection to the Toro TMR-1 handheld remote receiver. The TMR- 1 remote control system will provide long-range remote control of manual operations including: start, pause/resume, skip, restart and stop of selected stations, and fully automatic ASC (All Station Cycle) operation for system-wide operation.

1. Install the TMR-1 receiver per the instructions provided with the product.
2. Remove one of the auxiliary wiring access plugs from the bottom of the cabinet and insert the reciever cable.
3. Plug the modular connector into the RJ-11 jack.
4. Connect the reciever power wires to the adjacent terminal block as follows: Lift the terminal block lever, insert the bare wire, then secure the wire by pushing the lever down.
5. Refer to TMR-1 user guide for complete operating information.



Fuse Replacement

⚠ CAUTION: The fuse protects the transformer from overload and subsequent damage due to a short circuit condition. For continued protection against the risk of controller damage or fire, replace only with a fuse of the same type. Ensure power is OFF prior to removing/replacing the fuse.

1. Disconnect power to the controller.
2. Carefully remove the blown fuse from the PC board.
3. Replace with spare fuse (clipped to PCB) or 250V, 2A (Slo-Blo).
4. Restore power to the controller.

Specifications

Mechanical

- Cabinet (overall): 10.5" H x 17" W x 6" D
- Wiring Conduit Provisions:
  Field - 2.5" / 3" (64mm/76mm)
  Power - 0.50"/.75" (12.7mm/19mm)
  Aux. - 0.50"/1" (12.7mm/25.4mm)
- Operating Temperature Range: 32°F to 140°F (0°C to 60°C)
- Storage Temperature Range: -22°F to 149°F (-30°C to 65°C)

Electrical

- Input: 120 VAC, 50/60 Hz, 0.5A (24 W max.)
- Output (per station): 24 VAC, 50/60 Hz, 0.5A (12 VA max.)
- Output (total): 24 VAC, 50/60 Hz, 1.5A (36 VA max.)
- Master Valve/Pump Start Relay Output: 24 VAC, 0.5A
- Rain Sensor Compatability: Normally-closed
- Flow Sensor Compatability: Toro TFS Series or Data Industrial IR Series
- Fuse: 250V, 2A, Slo-Blo

Notes

The Toro Promise — Limited Five-Year Warranty

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrants, to the owner, each new piece of equipment (featured in the current catalog at date of installation) against defects in material and workmanship for for a period described below, provided they are used for irrigation purposes under manufacturer's recommended specifications. Product failures due to acts of God (i.e., lightning, flooding, etc.) are not covered by this warranty.

Neither Toro nor Toro Warranty Company is liable for failure of products not manufactured by them even though such products may be sold or used in conjunction with Toro products.

During such warranty period, we will repair or replace, at our option, any part found to be defective. Your remedy is limited solely to the replacement or repair of defective parts.

Return the defective part to your local Toro distributor, who may be listed in your telephone directoryYellow Pages under "Irrigation Supplies" or "Sprinkler Systems," or contact The Toro Warranty Company, P.O. Box 489, Riverside, California, 92502. For the location of your nearest Toro distributor, call 1-877-3676 inside the U.S. or 951-688-9221 outside the U.S.

This warranty does not apply where equipment is used, or installation is performed in any manner contrary to Toro's specifications and instructions, nor where equipment is altered or modified.

Neither Toro nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of equipment, including but not limited to: vegetation loss, the cost of substitute equipment or services required during periods of malfunction or resulting non-use, property damage or personal injury resulting from installer's actions, whether negligent or otherwise.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

All implied warranties, including those of merchantability and fitness for use, are limited to the duration of this express warranty.

Some states do not allow limitations of how long an implied warranty lasts, so the above limitation may not apply to you.

This warranty gives you specific legal rights and you may have other rights which vary from state to state.

The Toro Intelli-Sense Commercial Controller series are covered by this warranty for a period of five years from the date of installation.

FCC Compliance Information

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a FCC Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined 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:

- Reorient the receiving antenna.
- Relocate the irrigation controller with respect to the receiver.
- Move the irrigation controller away from the receiver.
- Plug the irrigation controller into a different outlet so that the irrigation controller and receiver are on different branch circuits.

Industrial Canada compliance information

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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