



Count on it.

SENTINEL FIELD CONTROLLER

User Guide

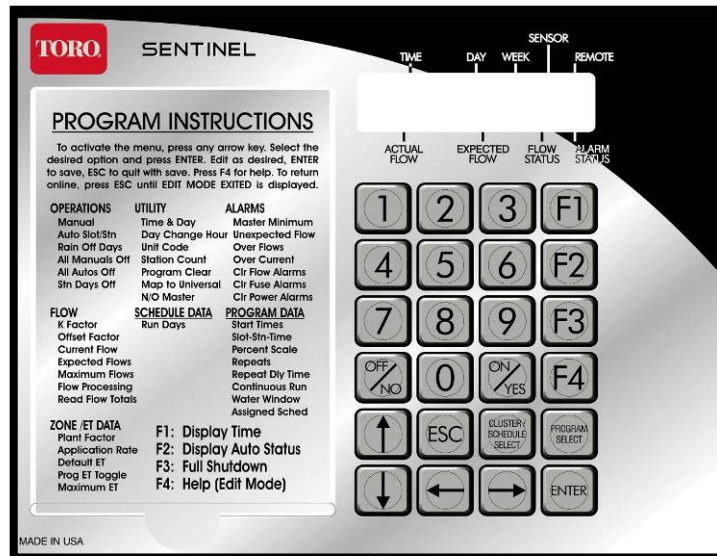


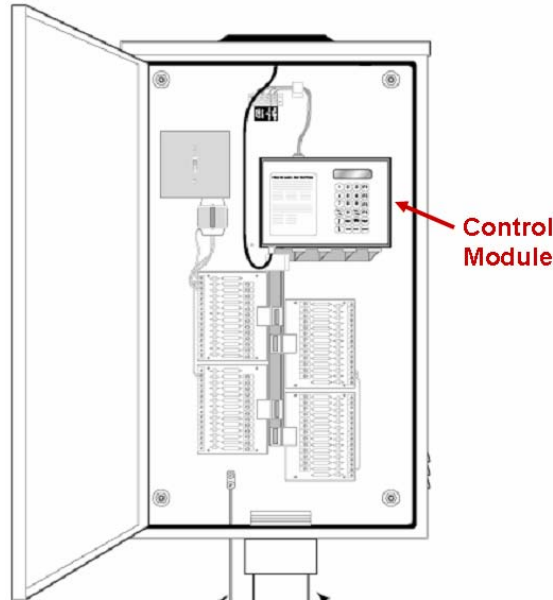
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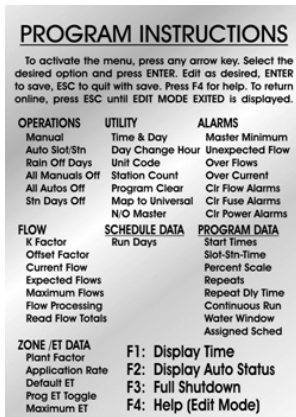
CHAPTER 1: SENTINEL CONTROL MODULE

I. CONTROL MODULE OVERVIEW

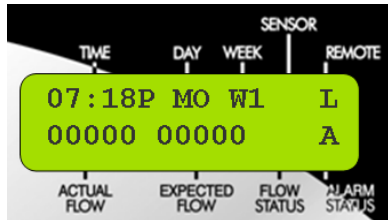


Your Sentinel Controller Interface has three main elements to use throughout the programming process. These are:

Program Instructions Card



Display



Keypad



The display, keypad and program instructions card are located on the front panel of the satellite control module. Programming as covered in this User's Guide will be through the keypad and display (not through the central software). The Program Instructions card is provided as a quick-reference of Main Menu and Submenu elements for controller programming.

Other visible elements of the satellite control module include the radio antenna connector, the station output ports (up to four 15-pin connectors), and the red “power on” light, all located on the bottom front side of the control module.

The back side panel of the control module is where the serial port (9-pin connector), data retrieval port (9-pin connector) and two fuse sockets are located. A red LED light is provided next to the fuse socket to indicate a blown fuse.

Sentinel satellite controllers are available in various station output configurations in 12-station increments, including 12-, 24-, 36-, and 48-stations.




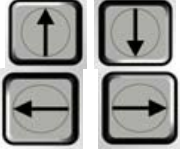
II. USER INTERFACE OVERVIEW (KEYPAD & DISPLAY)



Sentinel Control Module Keypad

The Sentinel Control Module has a 24-button keypad for use as the programming interface:



This keypad includes numeric buttons 1 – 9 and 0 used for numeric data entry. Also used in programming and operations are:


ON/YES & OFF/NO Keys		Used for manual operations as well as entering ON / OFF or YES / NO in programming.
ESC (Escape) Key		Used for exiting menus or Edit Mode and returning to normal operations (default screen)
ENTER Key		Used for functions like entering a selected submenu or saving information.
Arrow (Navigation) Keys		Used for navigating in Menus, Submenus, and Edit Modes, as well as incrementing values in programming.

CLUSTER / SCHEDULE SELECT Key		This button will be described in more detail in later parts of this guide. Used for selecting Clusters (groups of 4 programs) or schedules (run days) when programming.
PROGRAM SELECT Key		This button will be described in more detail in later parts of this guide. Used for selecting the Program (1-4) associated with a Clusters when programming.

Also included are four F-keys provided on the control module keypad to conveniently perform the following functions:

F1 Key  - Displays the time.

F2 Key  - Displays the status of the automatic programs.

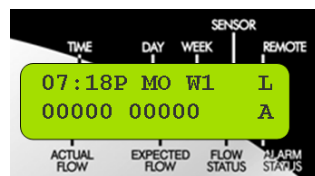
F3 Key  - Shuts down anything that is running (panic button).

IMPORTANT: The F3 key is not functional while in the Edit mode.

F4 Key  - Displays context sensitive help while in the Edit mode.

Sentinel Control Module Display

The Sentinel Controller has a two-line LCD for display of information. When you first walk up to your Sentinel controller, the display should be in its standard mode showing current time, day, week (of schedule), actual flow (if anything running) and expected flow. This display should look something like the following:



This display (as shown) indicates:

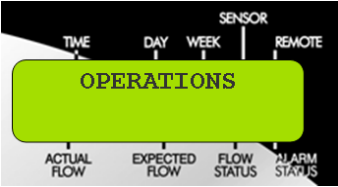
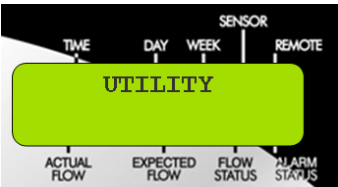
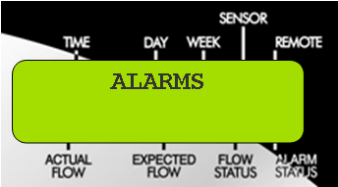
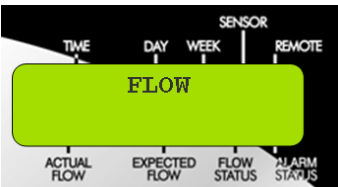
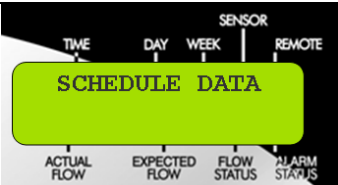
<i>Upper Line</i>	<i>Lower Line</i>
Time – 07:18 P (7:18 PM) Day – MO (Monday) Week (of schedule) – W1 (Week 1) Sensor – No current sensor indication Remote – L (Locked)	Actual Flow – 00000 (0 GPM) Expected Flow – 00000 (0 GPM) Flow Status – No current flow indicator Alarm Status – A (Alarm Exists)

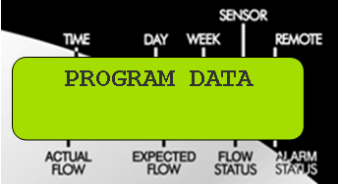
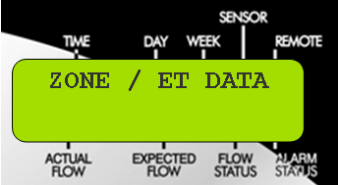
The standard indicators in the display are as follows:

TIME	HH:MM	Hours : Minutes (12-hour format)
	A	AM
	P	PM
DAY	SU	Sunday
	MO	Monday
	TU	Tuesday
	WE	Wednesday
	TH	Thursday
	FR	Friday
	SA	Saturday
WEEK	W1	Week 1 (one) of Schedule
	W2	Week 2 (two) of Schedule
	W3	Week 3 (three) of Schedule
	W4	Week 4 (four) of Schedule
	W5	Week 5 (five) of Schedule
	W6	Week 6 (six) of Schedule
SENSOR	1	Sensor Activated - Switch sensor is in alternate of its Normal condition. E.g. If Normally Open, then 1 = Sensor Closed.
	O	Dry contact (switch) sensor is Open
	C	Dry contact (switch) sensor is Closed
REMOTE	L	Field Unit is in remote “ Locked ” mode. Hand held radio will not activate watering functions within this unit.
	A	Field Unit is programmed for “ All Call ” handheld radio operation. Controller will respond to any and all handheld commands transmitted.
	S	Field Unit is programmed for “ Secure ” handheld radio operation. Controller will respond only to handheld commands addressed to its unit code.
ACTUAL FLOW	00000	5-digit numeric indicator of current flow through connected flow sensor
EXPECTED FLOW	00000	5-digit numeric indicator of expected flow based on current stations operating and their expected flows.
FLOW STATUS	+	Actual > Expected (Overflow)
	--	Actual < Expected (Underflow)
	:)	Actual = Expected (Flow is happy)
	A	Flow Alarm Exists
ALARM STATUS	A	Alarm Exists – Blank Otherwise

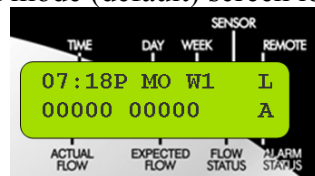
III. PROGRAMMING OVERVIEW & NAVIGATION










The Sentinel Controller is programmed by navigating through a Main Menu which includes seven options: *Operations*, *Utility*, *Alarms*, *Flow*, *Schedule Data*, *Program Data*, and *Zone/ET Data*. Each of these Main Menu options has a Submenu for entering and changing data. This structure is detailed below as well as being shown on the Program Instructions Card on the control module itself.


MENU	SUBMENU
	<ul style="list-style-type: none"> • Manual • Auto Slot / Station • Rain Off Days • All Manuals Off • All Autos Off • Station Days Off
	<ul style="list-style-type: none"> • Time & Day • Day Change Hour • Unit Code • Station Count • Program Clear • N/O Master • Wireless Group • Map Unit Precode • Two-Wire / Irritrol Mode
	<ul style="list-style-type: none"> • Master Minimum • Unexpected Flow • Over Flows • Over Currents • Clear Flow Alarms • Clear Fuse Alarms • Clear Map Alarms • Clear Power Fail
	<ul style="list-style-type: none"> • K Factor • Offset Factor • Current Flow • Expected Flows • Maximum Flows • Flow Processing • Read Flow Totals
	<ul style="list-style-type: none"> • Run Days

	<ul style="list-style-type: none"> • Start Times • Slot-Station-Time • Percent Scale • Repeats • Repeat Delay time • Continuous Run • Water Window • Assigned Schedule
	<ul style="list-style-type: none"> • Plant Factor • Application Rate • Default ET • Maximum ET • Program ET Toggle • Station Type • Map Stations

The controller normal mode (default) screen looks like:



- To enter the Main Menu from this default screen, you need to hit any of the arrow keys on the keypad: , , , or . This will bring up the **OPERATIONS** option of the Main menu.
- To navigate through the Main Menu, use the right or left arrow keys:  or .
- To enter a submenu for any of the Main menu options, use the up or down arrow keys:  or .
- When the desired submenu is reached, press the enter key  to view or change data in the submenu.

IMPORTANT: When entering data into one of the submenus, the controller is in the *Edit Mode*. The controller will not begin any scheduled operation until you have exited the *Edit Mode*. Programs that are running prior to entering the *Edit Mode* will continue running. Any time you enter or change any data, you must press the **ENTER**  key to save the data. Otherwise, the newly entered data will not be saved.

To exit the *Edit Mode*, press the **ESC**  (Escape) key once or twice as necessary to return to normal mode (default) screen. If you forget to press the **ESC** key, the controller will automatically revert to normal mode after two minutes.

CHAPTER 2: BASIC CONTROLLER PROGRAMMING

This section will provide the information on how to program the basic elements for automatic irrigation to occur. The following Menus and Submenu items will be used in this programming:

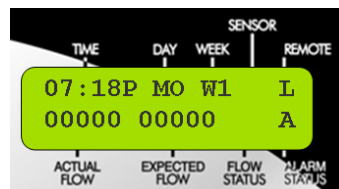
<i>Menu</i>	UTILITY	SCHEDULE DATA	PROGRAM DATA
<i>Submenu</i>	<ul style="list-style-type: none"> • Time & Day • Day Change Hour • Unit Code • Station Count • Master Valve 	<ul style="list-style-type: none"> • Run Days 	<ul style="list-style-type: none"> • Start Times • Slot-Station-Time • Percent Scale • Repeats • Repeat Delay Time • Continuous Run • Water Window • Assigned Schedule

I. CONTROLLER SETUP

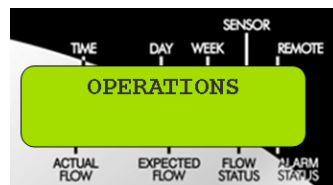
- Time & Day
- Day Change Hour
- Unit Code
- Station Count
- Master Valve

UTILITY → Time & Day → Edit Mode

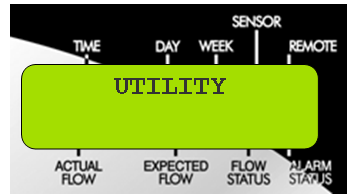
The controller setup functions are accessed through the Utility Menu. When starting from the normal mode (default screen) as shown below:




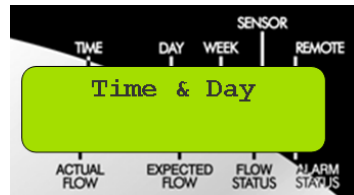
Hit any of the Arrow Keys (↑, ↓, ←, or →), once. This should bring up the Main Menu on **OPERATIONS**:




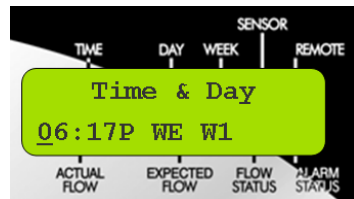
Hit the Right Arrow Key (→), once to bring up the **UTILITY** menu:







Hit the Down Arrow () , once to access the Utility Submenu and the first submenu option of **Time & Day**:







Hit Enter () to access the Time & Day Edit Mode:



You are now in the Edit Mode and can change the Time, Day, and Schedule Week in the controller. As in the example display above, the first digit of the hour should have the cursor under it, indicating you can change this value. Use the Numeric keys to change the Time. The cursor will automatically advance to the next digit, or you can use the Right and Left Arrow keys (, or ) , to move the cursor.

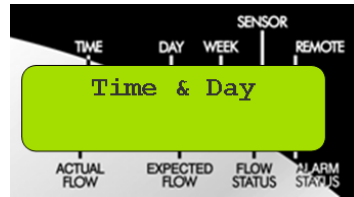
Use the Up or Down Arrow keys (, ) to change from AM (A) to PM (P) as necessary, when the cursor is on the A/P.


Use the Up or Down Arrow keys (, ) to change the Day of the week when the cursor is on the day.

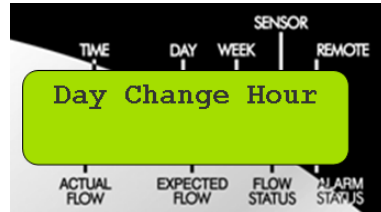
Use the Up or Down Arrow keys (, ) to change the Week (schedule week) when the cursor is on the week position. When initially programming the controller, set it to Week 1 (W1).

When all changes are made, hit the ENTER key () to save changes.

Hit the Escape key to exit to the Utility Submenu, Time & Day option:



Hit the Down Arrow () , once to access the submenu option of **Day Change Hour**:

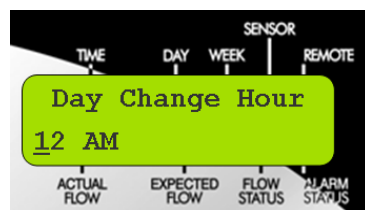





IMPORTANT: From this point forward in the User's Guide, we will not show step-by-step the navigation through the Main Menu and the Submenus and into the Edit Mode for each submenu. Navigation, editing, cursor movement, etc, works the same for all functions in controller programming.

Note: You must remember to hit ENTER () after changes have been made, or your changes will not be saved.

UTILITY → Day Change Hour → Edit Mode

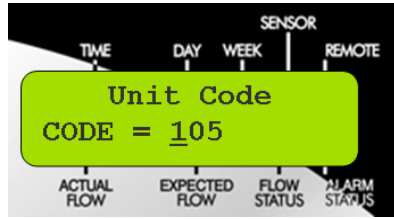
Sentinel allows you to choose the hour you want the controller to advance to the next day. As an example, the day would change from Monday to Tuesday at midnight. You can command the controller to wait until 8 AM Tuesday before it changes to Tuesday. This way, the controller will have until 8 AM Tuesday to finish all watering cycles on the Monday schedule.



To set the Day Change Hour, position the cursor under the item to be changed and edit as desired using the numeric keys on the keypad. Use the Up and Down Arrow keys (, ) for the AM/PM toggle field. Press the ENTER key () to save after editing.

UTILITY → Unit Code → Edit Mode

Every controller must have a three digit code assigned to it. This is known as the controller's address. You may select any three digit code from 000 to 999. This is the identifier that is used when selecting an individual field controller with the hand held radio or from the central controller.

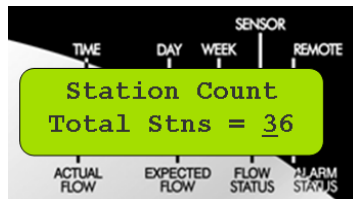


Position the cursor using the Right and Left Arrow keys (←, or →) under the digit being edited. Use the numeric keys on the keypad to edit. Press ENTER key (ENTER) to save after editing.

IMPORTANT: The unit code is required for Central Control operations. Even if most of the satellite programming will be from the central software, you need to set the Unit Code.

UTILITY → Station Count → Edit Mode

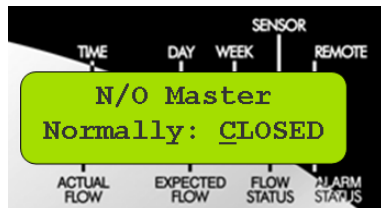
Use this menu to inform the controller the number of stations it has. The Sentinel controllers typically have station counts in 12-station increments (12, 24, 36, or 48).



Use the Up and Down Arrow keys (↑, ↓) to scroll through the station count options and specify the number of stations in the controller. Press the ENTER key (ENTER) to save after editing.

UTILITY → N/O Master → Edit Mode

This menu item allows you to configure the master valve/pump start output for either normally open or normally closed operation.



Use the Up and Down Arrow keys (↑, ↓) to toggle between **Normally: CLOSED** and **Normally: OPEN** options. Press the ENTER key (ENTER) to save after editing.

II. SCHEDULE SETUP

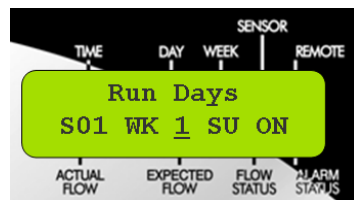
- Run Days

Schedule refers to the days of the week you want a program to run. Up to 16 unique watering day schedules can be defined in the Sentinel Controller. For identification, each schedule has a number assignment ranging from 1–16. In the Display of the controller, the schedules will be indicated by “S” and then the two-digit schedule Number (01, 02,... 16). For example, Schedule 12 would be shown as “S12.”

Each schedule is six weeks long with any combination of watering days and may be assigned to any of the sixteen programs (covered in Program Setup). You must assign a schedule to a program to activate it. The current Schedule Week was set in Time & Day as part of controller setup (example was set to W1). When the controller reaches the end of Week 6 (w6) it loops back and starts again with Week 1 (W1).






SCHEDULE DATA → Run Days → Edit Mode



Use this Submenu Edit Mode to configure the sixteen independent schedules (water days):








The second line of the display indicates as follows:

S01 = Schedule 1
WK 1 = Week 1 of Schedule
SU = Sunday
ON = On (active watering day)

Use the CLUSTER/SCHEDULE SELECT key  to select the schedule desired (S01...S16). Position the cursor using the Right and Left Arrow keys (, ) under the WK digit and use the Up or Down Arrow keys (, ) to select the week desired.

Position the cursor under the day of the week and use the Up or Down Arrow keys (, ) to select the weekday (SU, MO, TU, WE, TH, FR, SA) desired.

Position the cursor under the ON (or OFF) indication and use the OFF/NO or ON/YES keys (, ) or the Up or Down Arrow keys (, ) keys to designate the day as a watering day (ON) or a non-watering day (OFF).

Press ENTER () to save the status of the day. Continue this process to set up the entire schedule or to view the status of the other days.

As example, a Visual Representation of an every other day schedule follows:

	SU	MO	TU	WE	TH	FR	SA
WK1	ON	OFF	ON	OFF	ON	OFF	ON
WK2	OFF	ON	OFF	ON	OFF	ON	OFF
WK3	ON	OFF	ON	OFF	ON	OFF	ON
WK4	OFF	ON	OFF	ON	OFF	ON	OFF
WK5	ON	OFF	ON	OFF	ON	OFF	ON
WK6	OFF	ON	OFF	ON	OFF	ON	OFF

Summary:

16 Schedules: S01, S02,.....S16

6 Weeks per Schedule: WK1, WK2, WK3, WK4, WK5, WK6

7 Days per Week: SU, MO, TU, WE, TH, FR, SA

If you did not set current week in Time/Day – go back and do it.

III. PROGRAM SETUP

- Start Times
- Slot-Station-Time
- Percent Scale
- Repeats
- Repeat Delay Time
- Continuous Run
- Water Window
- Assigned Schedule

Sentinel controllers have sixteen independent Programs. They are divided into four Clusters (A through D) with four Programs (1 through 4) within each Cluster. For example, Cluster A Program 3 (CAP3) is one program and Cluster C Program 3 (CCP3) is another. When you are entering or changing data, always make sure the desired Cluster and Program are selected on the display. When needed in the Edit Mode, the desired cluster and program can be selected by using the CLUSTER / SCHEDULE SELECT key



and the PROGRAM SELECT key

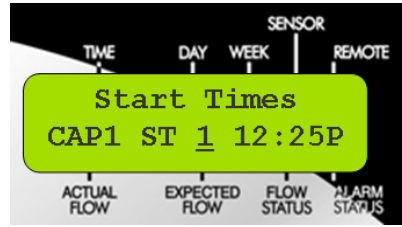






PROGRAM DATA → Start Times → Edit Mode



A Start Time initiates the automatic watering cycle. Each program can be assigned to start up eight times within a 24-hour period.

Note: All start times must occur within the defined Water Window time frame. When multiple start times are used, they must be spaced far enough apart to enable the program irrigation cycle to be completed.

The controller offers eight start times per program. If more than eight start times are needed, see Repeats and Continuous Run below. Use this submenu item to display/edit any one of the eight start times.




Use the CLUSTER/SCHEDULE SELECT () and the PROGRAM SELECT () keys to select the desired cluster & program, respectively. Use the Left and Right Arrow keys (, ) to position the cursor under the field being edited and edit as desired.

Use the Up and Down Arrow keys (, ) to select the Start Time to edit (ST 1, ST2,... ST 8).

Use the Numeric Keys to set the time.

Use the Up and Down Arrow keys (, ) to toggle to the A (AM) or P (PM).

To eliminate a start time, press the OFF / NO key ().

Press ENTER () to save the Start Time.

PROGRAM DATA → Slot-Stn-Time → Edit Mode

One of the most unique and powerful programming features of the Sentinel Controller is the method used to organize and control satellite station outputs within each irrigation program. This method is referred to as “Program Slots.” Program Slots are organized in a sequential matrix from Slot 1 to Slot 48, for a total of 48 slot positions.

The program operating sequence begins at Slot 1 and ends at Slot 48. Stations are assigned to a slot and given a run time duration ranging from 0 to 4 Hour and 15 Minutes. Station numbers range from 0 (inactive) to 48. Stations can be assigned to slots in any order and as many times as preferred (that is, one station can appear multiple times in the 48 Slots of one program, if desired).

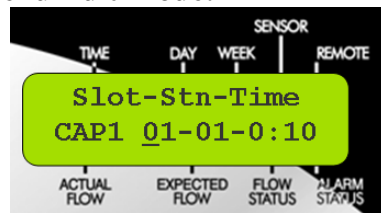
When an irrigation program is running, any slot with 0 (or blank) run time is ignored. A slot with an assigned run time duration ≥ 1 minute, but without a station assignment, will create a pause in the watering cycle for the assigned duration.

Sentinel programming allows you to reconfigure the operating order of the stations by enabling any station to be assigned to any slot.

Visually, the Slots can be represented in a matrix as follows:

Slot	Stn	Time	Slot	Stn	Time	Slot	Stn	Time	Slot	Stn	Time	Slot	Stn	Time
1			2			3			4			5		
6			7			8			9			10		
11			12			13			14			15		
16			17			18			19			20		
21			22			23			24			25		
26			27			28			29			30		
31			32			33			34			35		
36			37			38			39			40		
41			42			43			44			45		
46			47			48								

Slot-Stn-Time Submenu Edit Mode:







The second line of the display indicates as follows:




CAP1 = Cluster A, Program 1


01-01-0:10 = Slot 1 - Station 1 – 10 Minutes


From the factory, the Slot and Station numbers are set to be the same; i.e., Station 1 is assigned to Slot 1 and will run first. Station 2 will run next in Slot 2, etc. Use the

CLUSTER/SCHEDULE SELECT key  and the PROGRAM SELECT key  to select the desired cluster program.

Use the Right and Left Arrow keys (, ) to position the cursor under the slot field. Use the Up and Down Arrow keys (, ) to select the slot desired.

Use the Right Arrow key () to position the cursor under the Station field. Use the Up and Down Arrow keys (, ) to select the desired Station to run in the slot shown.

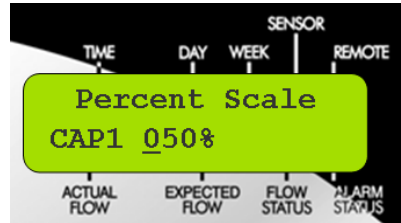
Press the Right Arrow key (), again, to position the cursor under the time field. Enter the desired run time using the Numeric keys from 0:00 to 4:15 (4 Hours and 15 Minutes)

Press ENTER () to save the Slot details. Continue this process to set up all the Slots or to view the status of the other Slots.

Note: This feature (The Slots in a Program) allows the user to run any station in any order desired and even repeat the desired station within the same program. Keep in mind that the controller will run the slots sequentially. Stations can be assigned to slots allowing any order of programming.

PROGRAM DATA → Percent Scale → Edit Mode

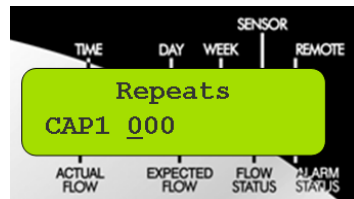
Percent Scale Adjusts the run time of all stations assigned to the program by percentage ranging from 0 to 255% (100% = no change).



Use the CLUSTER SELECT and the PROGRAM SELECT keys to select the desired cluster program. Position the cursor under the field being edited and edit as desired. Press ENTER to save.

PROGRAM DATA → Repeats → Edit Mode

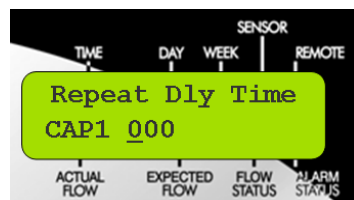
Repeats enables the watering cycle to be repeated from 1 to 250 times per start time.



Use the CLUSTER SELECT and the PROGRAM SELECT keys to select the desired cluster program. Position the cursor under the Repeat field and edit as desired. Press ENTER to save.

PROGRAM DATA → Repeat Dly Time → Edit Mode

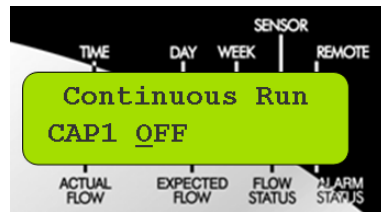
Repeat Delay Time places a delay period, ranging from 0 to 255 minutes, between program repeats. Use this menu item to display/edit the repeat delay time for any one of the 16 programs.



Use the CLUSTER SELECT and the PROGRAM SELECT to select the desired cluster program. Position the cursor under the field to be edited and edit as desired. This is used in conjunction with Repeats above. Press ENTER to save.

PROGRAM DATA → Continuous Run → Edit Mode

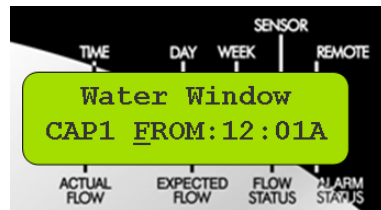
Selecting Continuous Run will automatically repeat the program cycle continuously for the defined Water Window duration.



The controller is capable of running any one or combination of programs continuously. To manually start the desired cluster program, use the same procedure as in Auto Slot/Stn. Use the CLUSTER SELECT and the PROGRAM SELECT keys to select the desired cluster program. Use the ON and OFF keys to turn continuous run on and off. Press ENTER to save. Use Water Windows below to set up continuous run start and stops automatically.

PROGRAM DATA → Water Window → Edit Mode

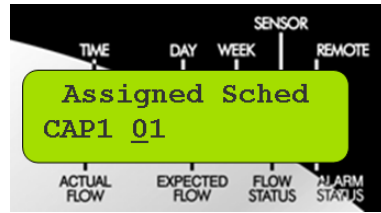
The Water Window is the period of time in a 24-hour day that automatic watering can occur. Selecting a **From** and **To** time defines the Water Window start time, duration and end time. A program that is running at the end of the Water Window is automatically terminated.



Use the CLUSTER SELECT and the PROGRAM SELECT keys to select the desired cluster program. Position the cursor under FROM or TO and toggle using the Up and Down arrow keys. Use the Right and Left arrow keys to position the cursor under the time digit to be edited and edit as desired. Use the Right arrow key to place the cursor under the A (AM) or P (PM) field. Press ENTER to save. Pressing the OFF key will clear the water window entry. Press ENTER after any change to save.

PROGRAM DATA → Selected Schedule → Edit Mode

Up to 16 unique watering day schedules can be defined in the controller. For identification, each schedule has a number assignment ranging from 1–16. each program must be assigned a schedule in order to run.



Use the CLUSTER SELECT and the PROGRAM SELECT keys to select the desired cluster program. Use the Right and Left arrow keys to position the cursor under the field to be edited and edit as desired. Use the Up and Down arrow keys to select from schedule 1–4. Press ENTER after any change to save.

Visually, the information and data input into a program includes the following:

CLUSTER: A B C D			PROGRAM: 1 2 3 4		
START TIMES		PERCENT SCALE		ASSIGNED SCHEDULE	
1.	___:___ AM / PM	_____ %		_____ (1-16)	
2.	___:___ AM / PM	REPEATS # of Repeats _____ Repeat Dly Time _____		CONTINUOUS RUN Yes / No	
3.	___:___ AM / PM				
4.	___:___ AM / PM	WATER WINDOW From: ___:___ AM / PM To: ___:___ AM / PM			
5.	___:___ AM / PM				
6.	___:___ AM / PM				
7.	___:___ AM / PM				
8.	___:___ AM / PM				

SLOT-STATION-TIME (Slot-Stn-Time)

Slot	Stn	Time	Slot	Stn	Time	Slot	Stn	Time	Slot	Stn	Time	Slot	Stn	Time
1			2			3			4			5		
6			7			8			9			10		
11			12			13			14			15		
16			17			18			19			20		
21			22			23			24			25		
26			27			28			29			30		
31			32			33			34			35		
36			37			38			39			40		
41			42			43			44			45		
46			47			48								

IMPORTANT! At this point, you have completed the required steps for Automatic Irrigation to occur. The remaining instructions in this user guide deal with advanced operations and functionality not yet covered.

CHAPTER 3: ADVANCED PROGRAMMING

This section covers Menus and Submenus not covered as part of Basic Programming.

I. OPERATIONS MENU

- Manual
- Auto Slot / Station
- Rain Off Days
- All manuals Off
- All Autos Off
- Station Days Off

Manual (Manual Station)

To manually operate stations, select Manual and press ENTER. Use the Up or Down arrow key to select the desired station number. Use the ON/YES key to turn the station On and the OFF/NO key to turn the station Off. A 30 minute run time is automatically set for the selected station. To change the run time, position the cursor using the Left or Right arrow key under the digit you wish to change, use the number keys to select the desired time (1 minute to 4 hours and 15 minutes), then press ENTER. You can repeat this procedure to run up to six stations at one time. When finished, press the ESC key twice.

***Note:** Exceeding the maximum allowable output current when turning on multiple stations will cause the controller to automatically turn off the station that caused the condition and flag the station so that it will not run again. This is a safety feature that prevents an over-current condition from exceeding the output capacity of the satellite. If the station is checked and found to be electrically safe, remove the disable flag through the Over Currents (Alarms) menu item.*

Auto Slot/Stn (Manual Program Start)

Auto Slot/Station - To manually start or stop any program, open the Auto Slot/Stn menu. Use the CLUSTER SELECT and the PROGRAM SELECT keys to choose the desired cluster program you want to run. You may start the program from any slot. It will start with Slot #1 unless you choose otherwise. Use the Right and Left arrow keys to maneuver to the slot field in the display. Use the Up and Down arrow keys to select the desired slot. Use the Left arrow key to place the cursor under the ON/OFF status. Use the Up or Down arrow keys to toggle the program status. When the ON/OFF status of the program(s) have been changed as desired, press the ENTER key to confirm. Press the ESC key twice to exit the Edit mode and allow the internal computer to change the program status. Allow up to 60 seconds for the changes to take effect.

***Note:** To stop the manually started Program, use the “All Autos Off” function under the OPERATIONS Menu. The “All Manuals Off” function stops only stations individually manually started, not stations started as part of a program.*

Rain Off Days

This menu item allows you to disable any program for a specific number of days. Select the Rain Off Days menu using the Right and Left arrow key. Use the CLUSTER SELECT and the PROGRAM SELECT keys to select the desired cluster program. Use the Right and Left arrow keys to place the cursor under the digit being changed (the number of days you want to activate rain shut down). Use the number keys on the keypad to edit the digit as desired. Press the ENTER key to save the new rain day value.

All Manuals Off (Manual Stations Off)

Selecting this from the menu system provides a quick way to turn off any stations that have been turned on manually without having to select each station individually. If more than one manual station is on, the controller will turn off one station at a time every five seconds to prevent the possibility of water hammer. Select All Manuals Off from the main menu using the Right and Left arrow key. Press ENTER to activate.

All Autos Off (Manual / Auto Programs Off)

Selecting this menu item will provide an automatic method to turn off any automatic programs (or manually started programs) that may be running. To activate, select this item from the main menu and press ENTER. One program will be shut down every five seconds. The display will show DONE when the process is complete.

Stn Days Off

Station Days Off - Selecting this menu item allows you to disable individual stations for the number of days desired. Choose Stn Days Off from the main menu. Select the station number by placing the cursor under the station number. Specify the amount of days off by entering it under the three digit rain days. Press the ENTER key to save the new value. The rain days will automatically decrease by one each day until the days off is zero. The station will then resume normal operation.

II. UTILITY MENU

- Program Clear
- Wireless Group
- Map Unit Precode
- Two-Wire / Irritrol Mode

Program Clear

This menu allows you to set all of the slot/station times within a selected program to zero. Select the cluster program to be cleared using the CLUSTER SELECT and the PROGRAM SELECT keys. Clear the selected program by toggling to ON and pressing the ENTER key. This function is helpful when clearing all 16 programs.

Manually clearing the station times in all 16 programs can be time consuming without this option.

Wireless Group

Function Not Used – Removed in Firmware Version 1.42

Map Unit Precode

Function Not Used – Removed in Firmware Version 1.42

Two-Wire / Irritrol Mode

The default/standard setting for this option is OFF. Set this option to ON if the Sentinel is connected to an Irritrol MC via RetroLink Card or if connected to a Two-Wire system. Press ENTER to save your selection.

III. FLOW MENU

- K factor
- Offset Factor
- Current Flow
- Expected Flows
- Maximum Flows
- Flow Processing
- Read Flow Totals

Note: If a flow meter is connected to the satellite sensor terminals, the controller will read and react to flow.

K Factor

This menu allows you to enter/edit the K factor associated with the flow metering device being used. The K factor may be found in the specification sheet for the flow meter. Edit the K factor by positioning the cursor under the desired digit and using the number keys of the keypad. Press ENTER when editing is complete.

Offset Factor

This menu allows you to enter/edit the Offset Factor associated with the flow metering device. The offset factor may be found in the specification sheet for the flow meter. Edit the offset factor by positioning the cursor under the desired digit and using the number keys of the keypad. Press ENTER when editing is complete.

Current Flow

Selecting this menu item will display the current flow meter reading in gallons per minute. Press ENTER to update the display as often as desired.

Expected Flows

This menu allows you to enter/edit the Expected Flow values (in gallons per minute) for individual stations. Use the Up and Down arrow keys to select stations and the Right and Left arrow keys to position the cursor under the digit being edited. Edit as desired and press ENTER to save the flow value. The controller will use expected flow values to calculate and provide a display of expected flow next to the actual flow in the controller display.

Expected flow values will be displayed even if there is no flow meter to collect and read actual flow values.

Maximum Flows

This menu allows you to specify/enter the maximum flow values in gallons per minute for each individual station. Use the Up and Down arrow keys to select the station and the Right and Left arrow keys to position the cursor under the digit being edited. Edit as desired and press ENTER to save the flow value. The maximum flow may be obtained (as a suggestion) by adding a percentage to the expected flow value. The percentage added will vary with system design, size and personal preferences. This maximum flow value will be used by the controller to check for flow-violating stations and to prevent their operation if an unacceptable flow condition occurs.

Flow Processing

This menu allows you to turn the flow processing functions off or on. After choosing this menu, toggle the Up or Down arrows to off or on and press ENTER.

Note: Do not turn on flow processing if it is not properly set up.

Read Flow Totals

To look at the current month's water usage, previous month's water usage or the previous year's water usage. Select Read Flow Totals from the menu and toggle the Up and Down arrows and the Left and Right arrows to view the desired information.

IV. ALARMS MENU

- Master Minimum
- Unexpected Flow
- Over Flows
- Over Currents
- Clear Flow Alarms
- Clear Fuse Alarms
- Clear Map Alarms
- Clear Power Fail

Note: The controller is capable of posting alarms when it detects excessive water flow or excessive current.

Master Minimum

Selecting this menu item will display the status of the minimum flow alarm. The normal status of this flag is off. It may be toggled on or off by using the Up and Down arrow keys. If this flag displays ON, there has been a minimum flow alarm. Correct the problem and set the flag to OFF. The minimum flow is necessary when the pump station requires a minimum flow for cooling purposes. This alarm will turn off the master output to save the pump from damage. The programs will continue to run. This alarm is operated by the central system.

Unexpected Flow

Selecting this menu item will display the status of the unexpected flow alarm. The normal status of this flag is off. It may be toggled to on or off by using the Up and Down arrow keys. If this flag displays ON, there has been an unexpected flow condition. Correct the problem if necessary and set the flag to OFF. This flag is set when the controller detects flow while no station is running in the field controller.

Over Flows

Selecting this menu item will display the flow alarm status of the individual stations. There must be a flow meter installed at the data retrieval port on the controller for this feature function. If flow values have been properly set, the controller will watch the flow as programs run. If there is a problem with a station such as broken line, broken heads, etc., the controller will set the alarm for that station. If there are numerous stations running at any one time and there is a flow problem with one station, the controller will shut down the stations one at a time and check flow. This process will continue until the malfunctioning station or stations are detected and disabled. Other stations that were running will return to normal operation one at a time.

Use the Up and Down arrow keys to step through the stations and view or edit the ON or OFF status of the flow alarms. The normal status is OFF. If the alarm status of a station is ON, the station will not run in automatic mode.

Clear the alarm by selecting the desired station and pressing the OFF key. A station may be disabled or eliminated from auto operation by manually turning the alarm status to ON. This is useful if the station is in need of repair or if disabling is desired for a single station.

Note: Disabling a station by setting its alarm status to ON does not change the length of time a program runs. The program will still reserve a time slot during operation, but will not energize the station.

Over Currents

Selecting this menu item will display the over current status of individual stations. Over current alarms are set to ON if a station has an electrical problem that can cause a fuse to blow if allowed to continue running. The status of the over current alarms may be changed by selecting the desired stations and pressing the ON/OFF keys.

Even when a station has been electrically disabled, the time management is left in the control of the operator.

Note: Over current protection does not operate while in the Edit mode.

Clear Flow Alarms

Clear Flow Alarms - Selecting this menu allows global clearing of all flow alarms on all stations. Pressing ENTER will execute the command and display WAIT. When the alarms are cleared, DONE will be displayed. Normal program operation will then resume.

Clear Fuse Alarms

Clear Fuse Alarms - Selecting this menu item allows global clearing of all fuse alarms on all stations. Pressing ENTER will execute the command and display WAIT. When the alarms are cleared, DONE will be displayed. Normal program operation will then resume.

Clear Map Alarms

Select this option to clear all remote output alarms. This includes all mapped output communication alarms. They may be MapTo Universal, Two-Wire, or wireless outputs. Pressing ENTER will execute the command and display WAIT. When the alarms are cleared, DONE will be displayed. Normal program operation will then resume.

Clear Power Fail

Clear Power Failure - Selecting this menu item allows clearing of the power failure alarm. Whenever power is lost, the power failure alarm is activated. Select Clr Power Fail from the menu and press ENTER to clear the alarm.

V. ZONE / ET DATA MENU

- Plant Factor
- Application Rate
- Default ET
- Maximum ET
- Program ET Toggle
- Station Type
- Map Station

Note: The controller is capable of running irrigation programs based on ET (evapotranspiration). When the ET functions are activated, the controller automatically adjusts program run times according to the ET data. A weather station or ET gauge needs to be connected to the sensor input terminals of the controller or at the central to provide ET data.

Plant Factor:

This menu item enables you to assign a percentage factor to any zone for the type of plant material that the zone is irrigating. For instance, you may assign a bluegrass turf zone a factor of 100% and a ground cover zone that needs less water a 50% factor. Use the Up and Down arrow keys to get to the station desired. Use the Right arrow to place the cursor under the percentage field and edit as desired. Press ENTER to save.

Application Rate:

This is the amount of water a zone applies in inches per hour. For example, a zone of fixed spray heads may apply the water at the rate of 2" per hour while a rotary sprinkler zone may apply water at the rate of 0.50" per hour.

You can determine a zone's application rate by multiplying its gallons per minute by 96.3 and dividing that figure by the square feet covered by the zone. To enter the application rate, use the Up and Down arrow keys to get to the station desired.

Use the Right arrow key to move the cursor under the application rate field and edit the data. Press ENTER to save.

Default ET

This is the minimum ET figure (in inches) that is used as the default ET regardless of the weather conditions or if data is missing from the ET gauge or weather station. ET can vary depending on the time of the season and weather. Generally, daily ET can be from 0.00" to 0.50". Use the Up or Down arrows to toggle the value up or down. Press ENTER to save.

Maximum ET

Set this to the maximum ET value that can be accumulated between watering days. This value is the maximum value that a program will ever replace in a single day. Typically choose a value that is your maximum daily ET multiplied by the number of days between watering.

Program ET Toggle

Set to ON for any programs you wish to run based on ET values, for time-based watering set to OFF.

Station Type

The following station types are available:

UNIVERSAL – Use this option to turn on outputs locally and on a universal map to (when mapped) (this is the default option)

LOCAL – Use this option to turn outputs on locally (out the front of the satellite).

BL-FL/PR – Not currently utilized. Baseline Flow & Pressure.

BL-SENS2 – Not currently utilized. Baseline Sensor.

BASELINE – Use this option to turn output on locally and on Baseline two-wire system.

TORO-2WD – Use this option to turn output on locally and on Toro two-wire system.

WIRELESS – Choose this option to run outputs on a wireless output board.

Map Stations

Each station can be mapped, or associated with hardware other than the Sentinel controller output board. This setting relates to “Station Type” as set above.

Version 1.41 Firmware:

MAP 01 to 000:00

MAP SS to CCC:NN

LOCAL output:

No mapping necessary, any values entered are ignored.

UNIVERSAL output:

Setting for MapTo Universal,

Set PPP = 000

Set CCC = unit code of map to universal field unit

Set NN = map to universal output number

Version 1.42 Firmware:

01 -> 000/000:00

SS -> PPP/CCC:NN

Each station can be mapped, or associated with other hardware by way of the 8 numbers to the right of the arrow. The fields labeled SS are the Sentinel station to be mapped (01-96). The rest of the fields depend on the station type selected:

LOCAL output:

No mapping necessary, any values entered are ignored.

UNIVERSAL output:

Setting for MapTo Universal,

Set PPP = 000
Set CCC = unit code of map to universal field unit
Set NN = map to universal output number

BASELINE:

SS corresponds to the Baseline decoder address, mapped in the Baseline setup software to a physical decoder

Set PPP = 000

Set CCC = 001 (address of Baseline gateway connected to Sentinel serial port)

Set NN = Baseline decoder output number 01-04

TORO-2WD:

Set PPP/CCC = 0 + 5 digit decoder address

Set NN = decoder output number 01-04

WIRELESS Output:

Set PPP/CC to 000/00

The last C digit is the board number.

NN is the output number (01-12)

