RAIN BIRD ®

MSC+ Controller
Operation Manual

NUMBER OF START TIMES

STATION NUMBER

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

START DAYS   S   M   T   W   TH   F   S

SCHEDULE   A   B   C   D   E   F   G   H   M   SS

MAXI
LOCAL
MANUAL
OFF

START / ADVANCE

PAUSE / RESUME

CANCEL / CLEAR

CONTROL MODE

STATION RUN TIMES

START TIMES

START DAYS

WATER BUDGET

WEEKDAY / CYCLE

COPY STORE

COPY PASTE

CLOCK STATUS

SCHEDULE MONITOR

MANUAL

SINGLE STATION

SET CLOCK

STATION RUN TIME LOG

SPECIAL FUNCTIONS

RAIN BIRD ®

MSC+

Contents

Introduction

Congratulations on purchasing a Rain Bird MSC+ irrigation controller. The MSC+ electrically controls up to 48 watering stations. Each station can control from one to four valves.

The MSC+ lets you program eight different watering schedules (A, B, C, D, E, F, G, and H) for automatic operation. Each automatic schedule can have up to 12 start times per day.

The MSC+ also has Manual (M) and Single Station (SS) schedules that offer manual operation of multiple and single stations for additional convenience and watering flexibility.

Controls and Indicators

This illustration shows the controls and indicators on the front panel of the MSC+ controller.

❶ **Station Number LEDs** (Light Emitting Diodes) — Indicate station activity, or a station's number of start times or start days

❷ **Schedule LEDs** — Indicate which of ten possible schedules is being programmed or monitored

❸ **Schedule** button — Selects a schedule to start, program, or view

❹ **Start / Advance** button — Manually starts a schedule or advances to the next station in sequence

❺ **Pause / Resume** button — Manually pauses a schedule, or resumes it after pausing

❻ **Cancel / Clear** button — Cancels operation of a schedule in progress

❼ **LCD** (Liquid Crystal Display) screen — Displays controller information and prompts the user for input. Displays data for the function being programmed or monitored.

❽ **Display Control** buttons — Used to select or enter data for the watering schedule or function being programmed

❾ **Control Mode LEDs** — Show the controller's current operating mode

• MAXI — Controller set to respond to a central control unit

• Local — "Standalone" operation mode; controller responds to automatic or manual starts

• Manual — Allows only manual operation

• Off — Controller off; no operation

❿ **Control Mode** button — Used to select the desired controller operation mode
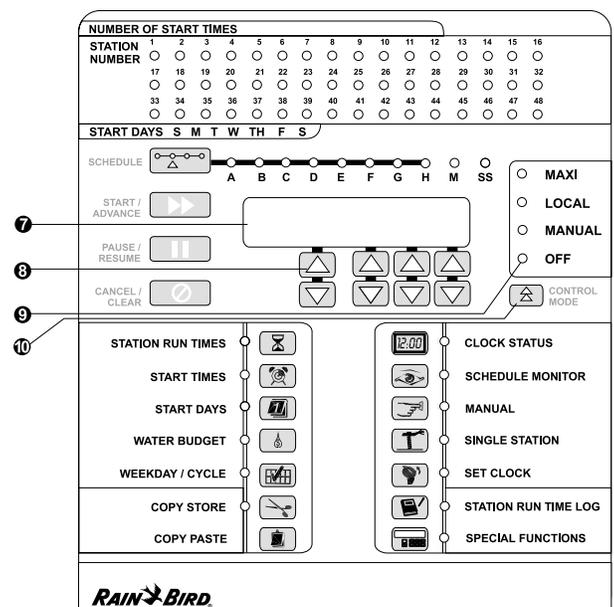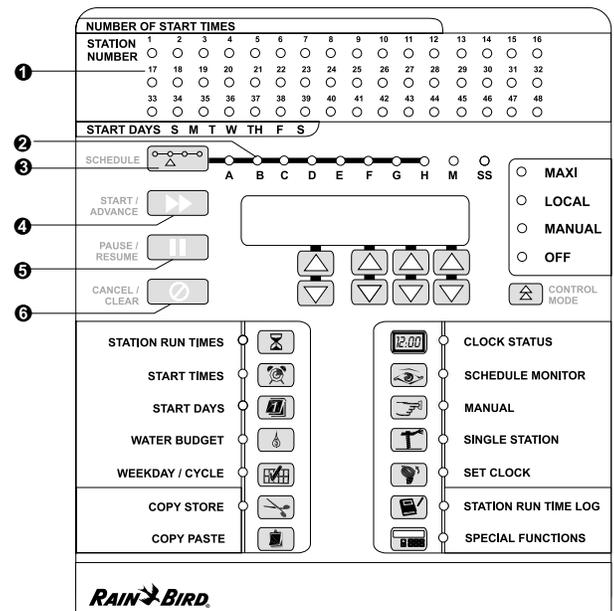
⑪ Station Run Times button — Used to select stations and enter their desired run time

⑫ Start Times button — Used to program or view a schedule's start time(s)

⑬ Start Days button — Used to program or view the days on which a schedule waters. Works in conjunction with the Weekday / Cycle button.

⑭ Water Budget button — Used to program or view a schedule's water budget percentage

⑮ Weekday / Cycle button — Used to select a Start Day method (Cycle Day method or Weekday method) for a watering schedule

⑯ Copy Store button — Stores displayed data into memory

⑰ Copy Paste button — Pastes a stored value from memory into the function being programmed

⑱ Clock Status button — Used to view the Clock Status screen

⑲ Schedule Monitor button — Used to monitor the operation or status of a schedule

⑳ Manual button — Used to select and operate stations manually

㉑ Single Station button — Used to monitor Single Station (SS) schedule status and change SS run times

㉒ Set Clock button — Used to set the controller clock's day and time

㉓ Station Run Time Log button — Used to activate the Station Run Time Log

㉔ Special Functions button — Used to access various special controller functions, such as the Over Current Log, Passkey access, Valves Per Station, Display Language, Satellite IDs, and other special diagnostic tests
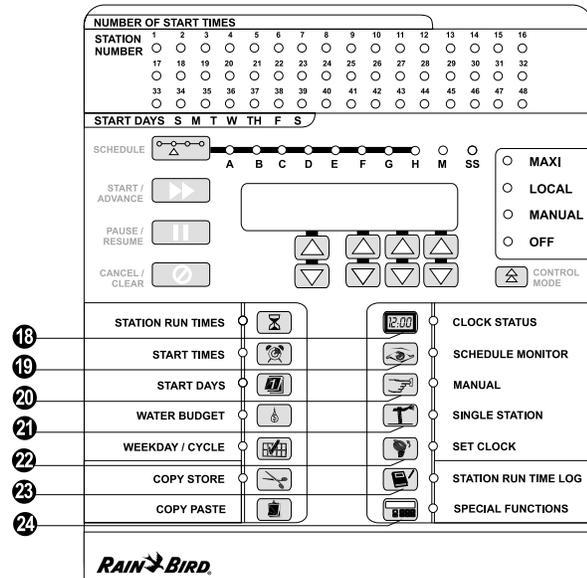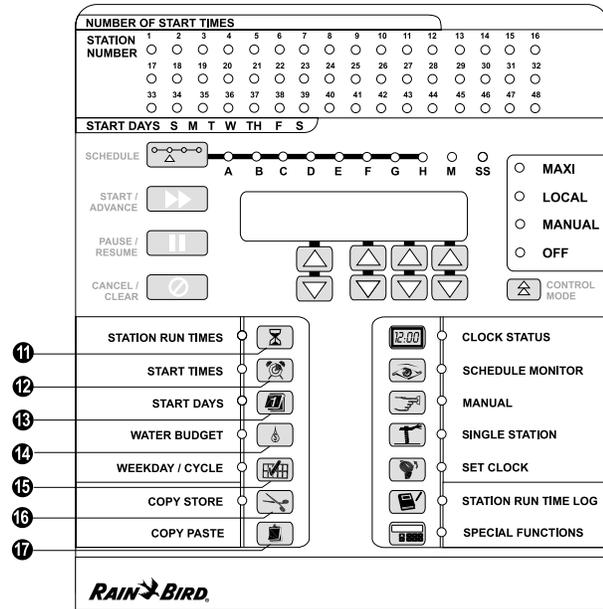
Programming the Controller

Definitions

The MSC+ controller offers eight automatic watering schedules (A through H). The MSC+ also has schedules that offer Manual (M) and Single Station (SS) operation. These schedules let you customize your watering to meet the needs of different types of plants, soil conditions, slopes, sunny or shady areas, watering windows, etc.

Programming is the process of telling the controller exactly when and how long you want to water. The controller opens and closes each station's remote control valves according to the information you program into each schedule.

You will need to understand the following terms to successfully program your MSC+ controller.

Watering day cycle — The period of days in which the controller repeats the watering schedule you set. The MSC+ offers two different watering day cycles:

- **Cycle day method** — Waters on a daily interval from one to 31 days (e.g., every third day, every fifth day, etc.) Watering always occurs on the last day of the selected watering cycle.

- **Weekday method** — Waters on the days of the week you select. A Weekday Cycle lets you set a custom watering cycle in which any day of the week can be a watering day.

Watering days — The specific days of the week when watering takes place.

Start time(s) — The time (or times) of day that a schedule begins. This is the time the first station in the schedule begins watering; all other stations then follow in sequence.

> ⚠ **NOTE:** The term "start time" refers to the time that the schedule starts, not to the time that each individual station begins to run.

Run time — The number of minutes that each station runs.

Programming Checklist

To program your MSC+ controller for the first time, we recommend that you complete the steps shown at right in order. For your convenience, a check-off box (❑) is provided for each step.

Programming Checklist

Power-Up the Controller

Verify that the MSC+ controller has been properly installed (consult the PAR+ and MSC+ Controller Installation Manual for installation and power wiring details).

❶ Make sure the MSC+ is connected to a working AC power source of the correct voltage.

❷ Remove the pedestal front door and turn the power switch (located on the top right hand side of the OSM module's mounting bracket) to the ON ("I") position.

❸ The front panel LCD will display "MSC+," the number of installed stations, and "SYSTEM SELF TEST" immediately after applying power. Each front panel LED will briefly light in sequence during the initial power-on self test.

❹ The MSC+ verifies that it is operating properly and displays the Clock Status LCD screen after completing its power-on self test.
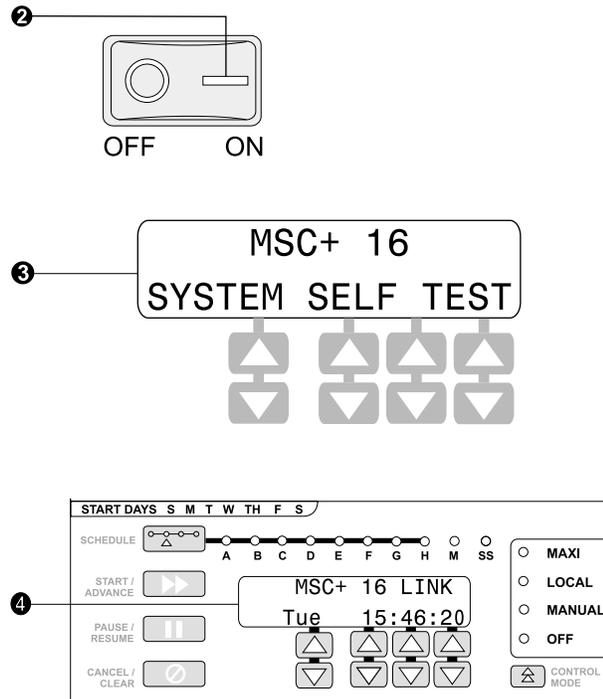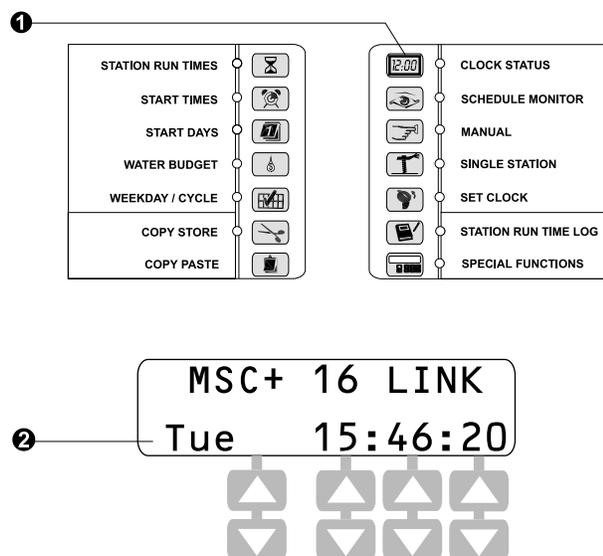
Clock Status Mode

Clock Status is the MSC+ controller's reset and default LCD display mode. The LCD display always returns to Clock Status whenever power is reapplied, or after ten minutes of inactivity on the front panel buttons.

❶ To reach the Clock Status screen at any time, press the CLOCK STATUS button.

❷ The Clock Status screen appears, with line 1 of the display showing the controller type, the total number of stations installed, and the MAXI interface mode (two-wire or link). Line 2 displays the current day and time (in 24-hour format; e.g., 14:00 = 2 PM).
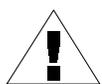
⚠ **NOTE**: If no MAXI interface module is installed, the Maxi interface mode will be blank, indicating it is a standalone controller.

OFF   ON


```
MSC+ 16
SYSTEM SELF TEST
```



```
MSC+ 16 LINK
Tue    15:46:20
```


STATION RUN TIMES	CLOCK STATUS
START TIMES	SCHEDULE MONITOR
START DAYS	MANUAL
WATER BUDGET	SINGLE STATION
WEEKDAY / CYCLE	SET CLOCK
COPY STORE	STATION RUN TIME LOG
COPY PASTE	SPECIAL FUNCTIONS

```
MSC+ 16 LINK
Tue    15:46:20
```

❸ The Schedule LEDs (A – SS), if on, indicate schedule(s) that are currently active.

❹ The Station LEDs (1 – 48) indicate activity as follows:

• Solid red LED — Indicates a currently active station

• Fast-blinking LED — Indicates an over-current problem on that station

• Slow-blinking LED — Indicates pending activity for that station
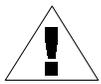
NOTE: Pressing the CANCEL / CLEAR button while in Clock Status mode cancels ALL locally controlled schedules in progress. Stations activated by a central control system (MAXI schedules) can only be cancelled by setting the Control Mode to "Off" or "Local."
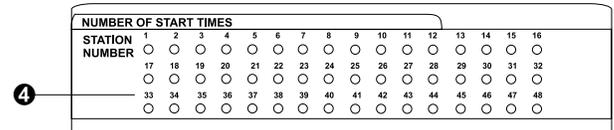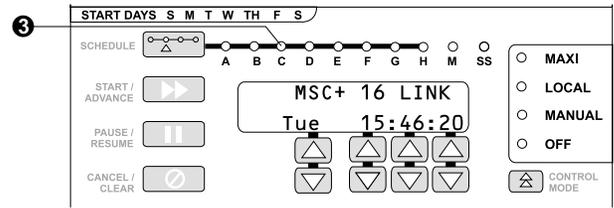
Control Modes

The Control Mode button lets you select any of the MSC+ controller's four operating "modes."

❶ Press the Control Mode button to choose the desired control mode.

❷ The selected Control Mode LED lights to indicate which control mode is currently active.

❸ MAXI Mode (Central Control): If the MAXI LED is solidly lit, the controller is in communication with the central control system and will respond to central control commands. The controller also allows Manual starts in MAXI Mode. If the MAXI LED flashes rapidly, the controller is NOT receiving communication from the central unit, and will behave as if in Local Mode until communication is established.


MSC+ Operation Manual
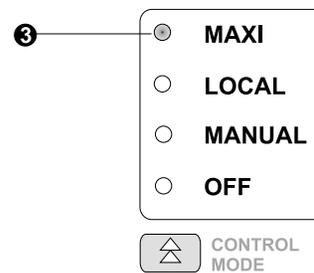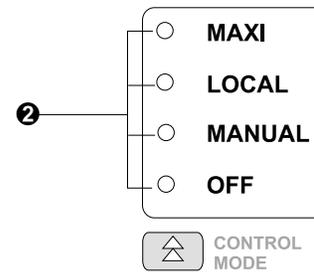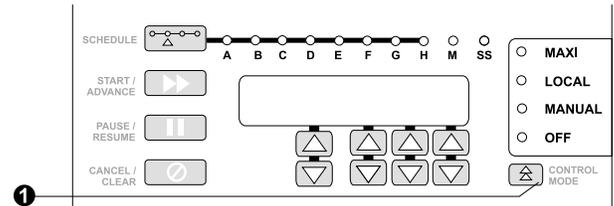
❹ Local Mode (Standalone Operation): "Standalone" means that the controller will not respond to commands from a central control system. If you place the controller in Local Mode, it will respond to automatic schedule starts (A – H) or manual starts (M & SS), but not to any central control system commands.

❺ Manual Mode: In Manual Mode, the controller will respond only to manual starts (schedules M or SS), not to any automatic schedule starts (A – H) or central control system (MAXI) commands.

❻ Off Mode: Off Mode prevents all watering. The controller will not respond to any starts, either automatic or from a central control unit. Turning the controller off will also stop any schedule currently watering (after the LED flashes for five seconds). You can use Off Mode to suspend watering during rainy periods, system maintenance, or seasonal shutdown.
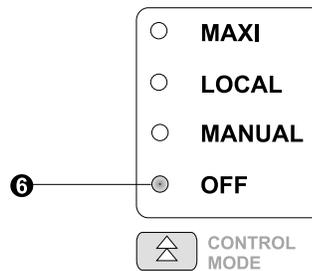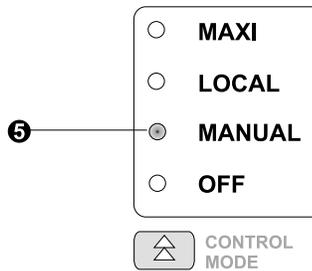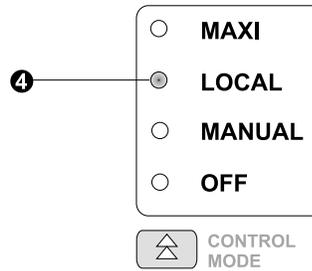
Set the Clock (Day & Time)

❶ To set the controller's internal clock, press the SET CLOCK button. The LCD displays the "Set Clock" screen.
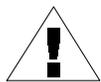
> **NOTE:** The clock displays all times in 24-hour time format (e.g., 1 PM = 13:00, 4 PM = 16:00, etc.)

❷ To set the current day of the week, press the column 1 arrow keys until the display shows the correct day.

❸ To set the current hour, press the column 2 arrow keys until the display shows the correct hour.

❹ To set the current minute and second, press the column 3 arrow keys until the display shows the correct minute. Then press the column 4 arrow keys until the display shows the correct second.
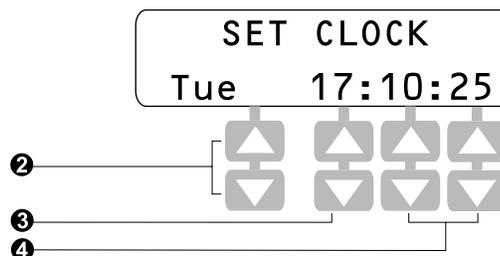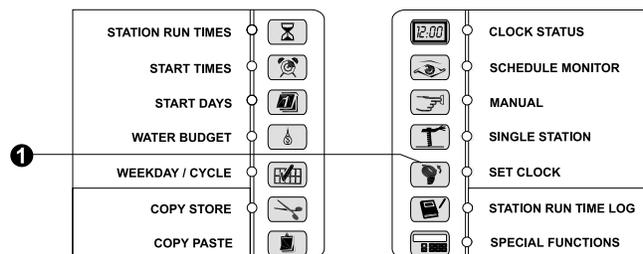
❺ When the display shows the desired day and time, press START / ADVANCE to accept the time shown and return to Clock Status mode. You may press CANCEL / CLEAR to cancel the time change and return to the Clock Status screen. (If you do not press START / ADVANCE within 10 minutes, the system will automatically cancel the changes and return to the "Clock Status" screen).
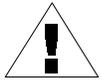
⚠️ **NOTE**: The new time will not affect schedules currently in progress (or any stacked schedules). All subsequent schedules will run based on the new time.
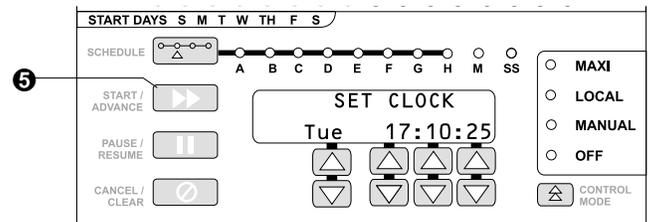
Select Start Day Method

The WEEKDAY / CYCLE button lets you select the Start Day method for schedules A through H and SS. The Start Day Method determines the type of watering day cycle for a schedule.

To select the schedule you want to program, press the SCHEDULE button until the desired schedule LED lights.

Each schedule can operate in one of two Start Day methods:

• **Cycle Day method** — The schedule waters on a daily interval from one to 31 days (for example, every third day, every fifth day, etc.; to a maximum interval of 31 days). If you select the Cycle Day method, watering always occurs on the last day of the selected watering cycle.

• **Weekday method** — The schedule waters on the days of the week you select. A Weekday Cycle lets you to set a custom watering cycle in which any day of the week can be a watering day (for example, Monday, Wednesday, Friday; or Tuesday, Thursday, Saturday, etc.)

❶ To select a Start Day Method, press the WEEKDAY /CYCLE button. The adjacent LED and the last selected schedule LED both light. You can press the SCHEDULE button if you want to program another schedule.
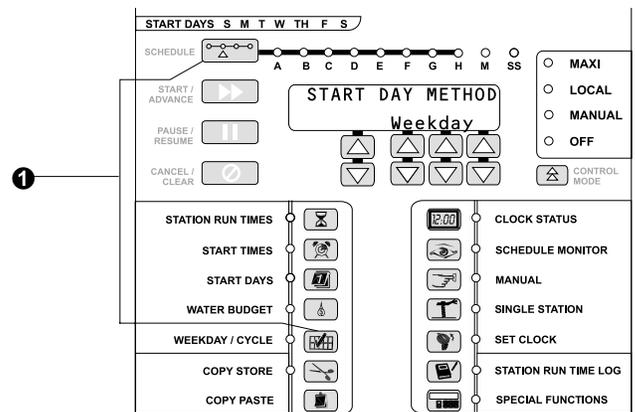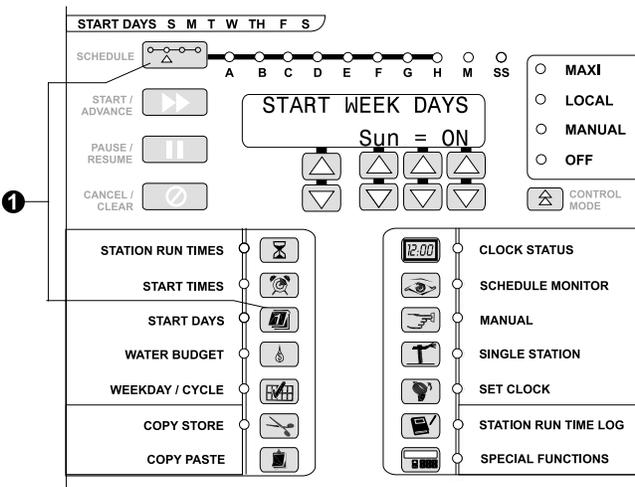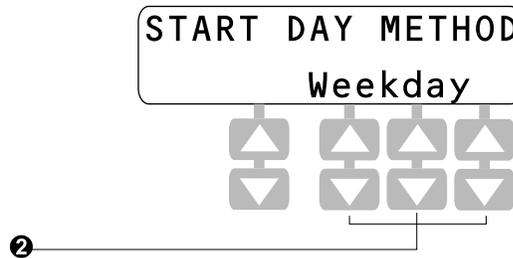
❷ Press the column 2, 3, or 4 arrow keys to toggle between Weekday and Cycle Day Methods. If you selected schedule SS, you can use the column 1 arrow keys to select the desired station.

❸ You can now program watering days for the selected schedule according to the Start Day method you selected.
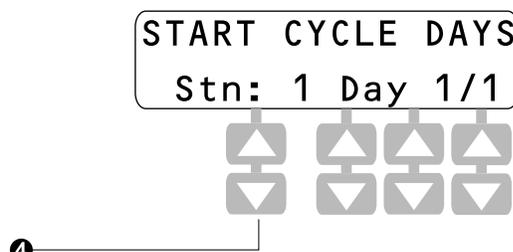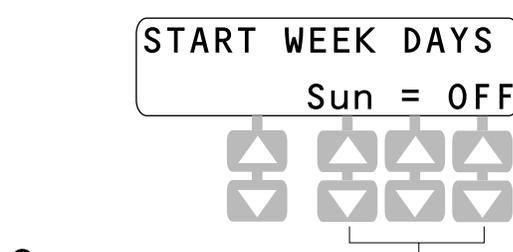
Select Watering Start Days

If you select a Weekday Method, you may choose to water on any or all days within the week. If you select the Cycle Day Method, the schedule will water every other day, every third day, etc., up to every 31st day. Follow the procedure for the Start Day Method you selected.
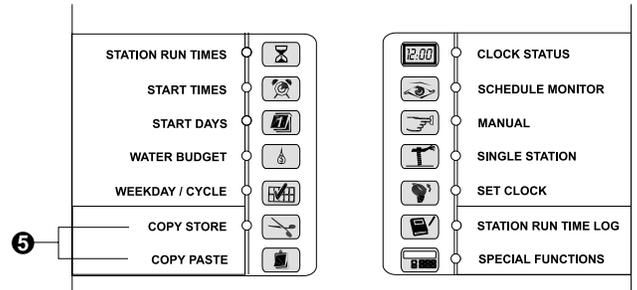
Weekday Method

❶ Press the START DAYS button. The LED and the last selected schedule LED both light. To select a different schedule, press the SCHEDULE button.

❷ Solid red lights on Station LEDs 33 through 39 indicate the active watering days (days when irrigation occurs). These LEDs correspond to Sunday through Saturday. (The controller's reset default is all seven days on).

❸ Line 2 of the LCD shows the day of the week and its irrigation status (OFF or ON). To change the day, press the column 2 arrow keys. To change each day's OFF/ON watering status, press the column 4 arrow keys.

❹ If you selected the SS schedule, the station number appears in column 1, and you can use the column 1 arrow keys to scroll through the station numbers and select the desired station.
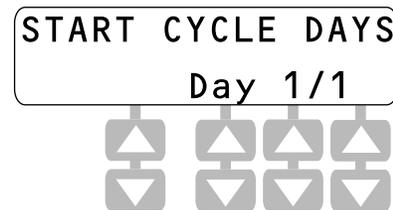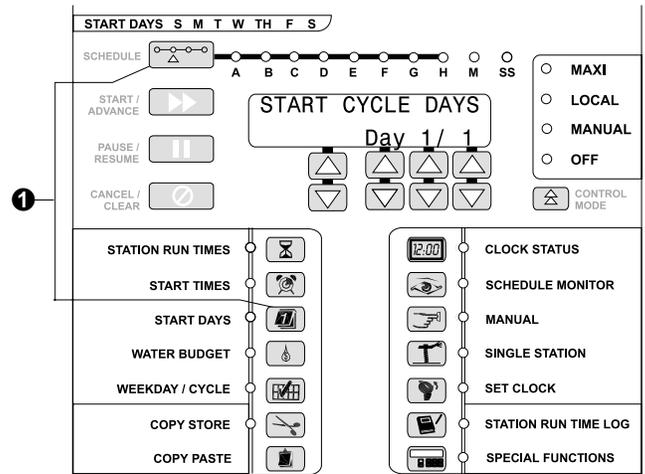
❺ If you want to use the same combination of watering days in another schedule, press COPY / STORE to store the watering day information into memory. Then press the Schedule button to select the other schedule and press COPY / PASTE to paste the stored watering days into the new schedule.

Cycle Day Method

❶ Press the START DAYS button. The adjacent LED and the last selected schedule LED will illuminate. To select a different schedule, press the SCHEDULE button.

❷ The LCD displays the current day of the cycle followed by the total number of days in the cycle; the reset default is "day 1 of 1 days." Remember that irrigation always occurs on the last day of the watering cycle.

❸ To change the total number of days in the watering cycle, press the column 4 arrow keys until the desired watering day cycle appears. The days scroll from 1 through 31.

❹ You can change the current day in the watering cycle using the column 3 arrow keys. The days scroll from 1 to the total number of days you selected for the cycle. Remember that when using the Cycle Day method, irrigation occurs only on the last day of the cycle.

❺ If you selected the SS schedule, the station number appears in column 1. You can use the column 1 arrow keys to scroll through the stations.
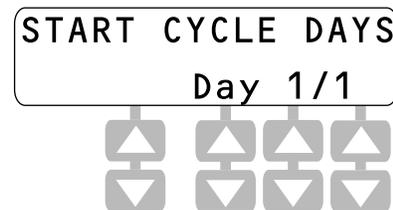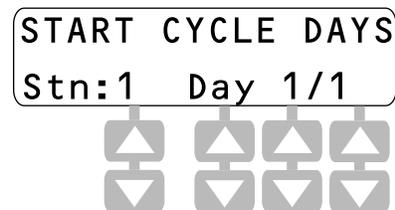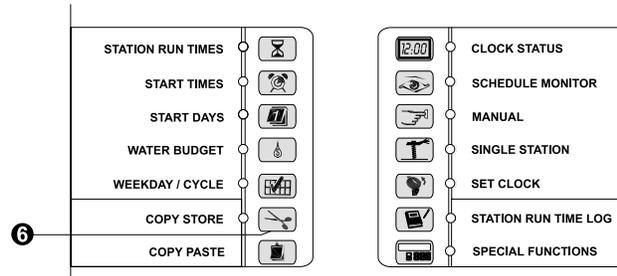
❻ If you want to use the same watering day cycle in another schedule, press COPY / STORE to store the information in memory. Then press the Schedule button to select another schedule and press COPY / PASTE to paste the stored watering day cycle into the new schedule.
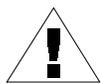
Set Schedule Start Time(s)

The start time determines when each schedule begins watering. You may assign up to 12 start times per day to schedules A through H and SS. The Manual schedule (M) can only be started manually and does not accept automatic start times.

Multiple start times let you run a schedule more than once each day. For example, in an area with a steep slope, you may wish to use several starts per day with short station run times to help prevent runoff and decrease erosion.

If the start time of one schedule overlaps an active watering schedule, the second schedule will be "stacked" to begin as soon as the first schedule finishes watering.

⚠️ **NOTE**: The MSC+ controller always places start times in chronological order (from earliest to latest), regardless of the order they were entered.

❶ To enter a start time for a schedule, press the START TIMES button. The LED and the last selected schedule LED both light. To select a different schedule, press the SCHEDULE button.

❷ The number of solid red lights on the first 12 station LEDs indicate the number of start times currently programmed into the selected schedule.

❸ Line 2, column 2 of the display shows the first start number and time. Use the column 1 and 2 arrow keys to scroll between start number 1 and the first unprogrammed start number (up to 12).
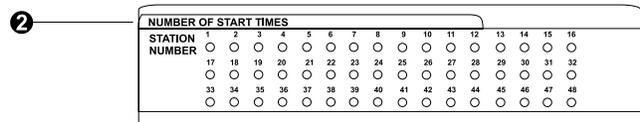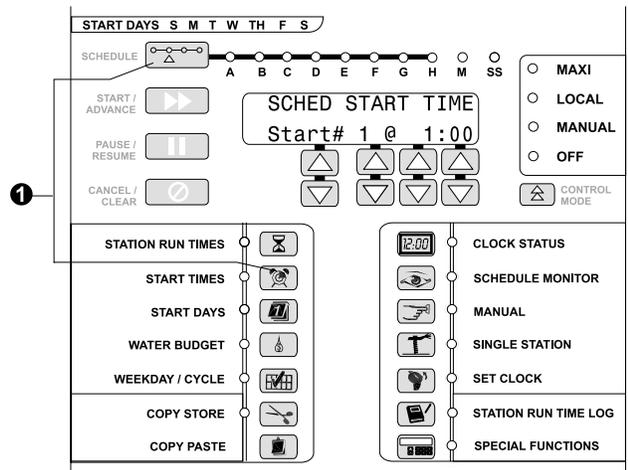
❹ If you selected the SS schedule, the display shows the schedule number in column 1. You can use the column 1 arrow keys to change the station number.

❺ Press the column 3 and 4 arrow keys to set the schedule's start time in hours and minutes. Remember, all start times are set and displayed in 24-hour time format (for example, 16:00 = 4 PM).

❻ If you want to copy the start time on the display into memory, press COPY/STORE. The Copy Store LED lights and the display blinks, indicating that the data has been stored. Press the COPY/PASTE button to paste the start time into another currently selected start number or station.

❼ To delete a start time, bring up the unwanted start time in the display (as described in Step 3). Then press CANCEL / CLEAR to remove it. The MSC+ reorders the start times whenever mode or schedule changes occur, so there will be no skipped start numbers and start times will always be in chronological order (from earliest to latest).
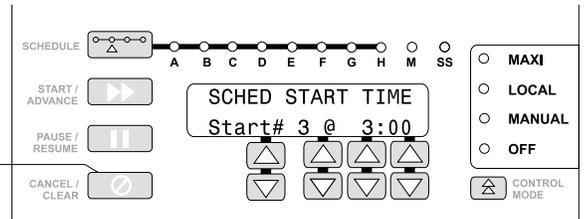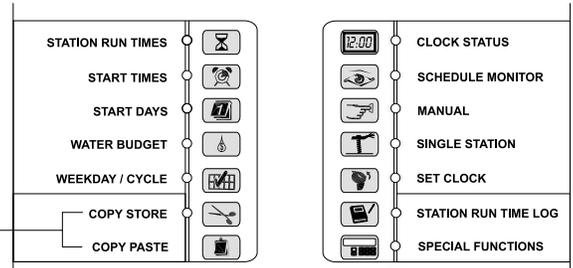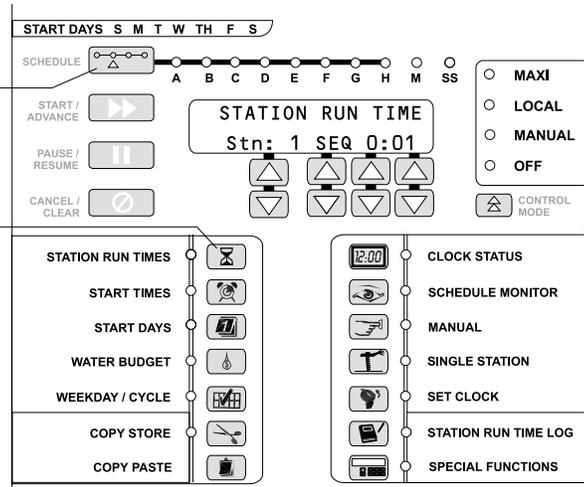
Set Station Run Times

This function lets you program the run times for each station on a schedule. You can set each station to run from one minute to a maximum of four hours.

❶ Press the STATION RUN TIMES button. The LED and the last selected schedule LED both light. To select another schedule, press the SCHEDULE button.

❷ A solid red light on any Station LED (1 – 48) indicates that the station has a run time greater than zero.

3 If the selected schedule has a Water Budget setting other than 100%, the Water Budget LED will flash.

4 Station 1 appears in line 2, column 1 of the display. If you want to set the run time for another station, press either the STATION RUN TIMES button, or the arrow keys in column 1 until the desired station number appears in the display.

5 Column 2 shows the station operation mode; SIM for simultaneous, or SEQ for sequential (unless you selected the SS schedule). The column 2 arrows toggle between options (unless a schedule is currently active). The watering mode will be the same for all stations on a schedule, but each schedule may be set to either SIM or SEQ.

6 Use the column 3 and 4 arrow keys to enter the desired run time for each station (in hours and minutes, up to a four hour maximum). Press CANCEL/CLEAR to reset the run time to zero.

7 If you want to copy the run time shown on the display into another station, press COPY/STORE. The Copy Store LED lights and the display blinks, indicating that the data has been stored. Press the column 1 arrow keys to select the desired station and press the COPY/PASTE button to paste the run time into the station.
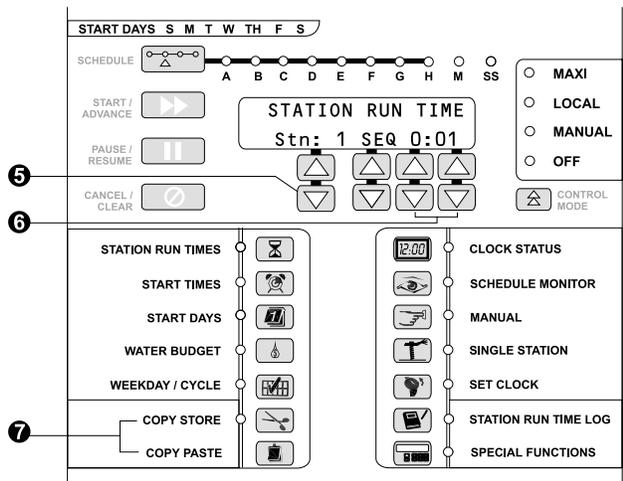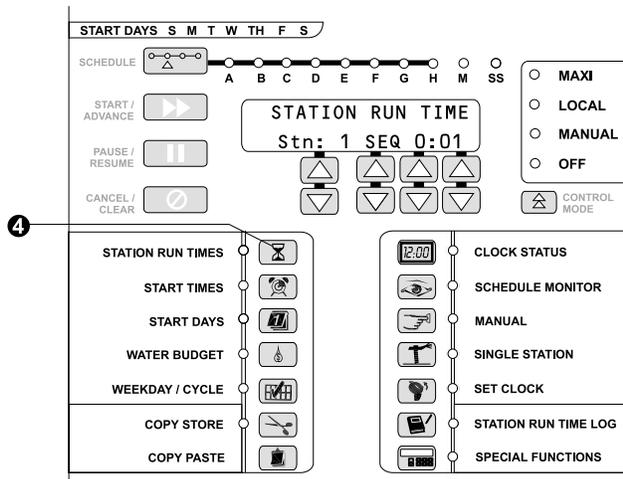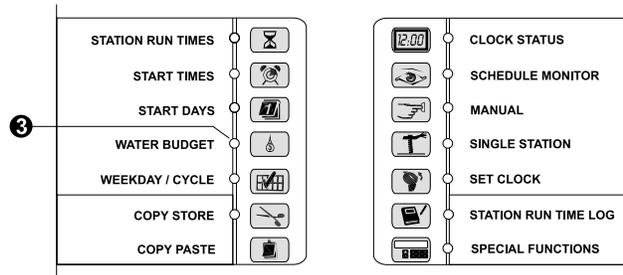
❽ Pressing START/ADVANCE causes the selected schedule to begin watering from the first station run time. If the schedule is already running, the next station in sequence will start. For example, if station three is watering pressing START/ADVANCE will stop station three and start station four.

Pressing START/ADVANCE while the last scheduled station is watering stops the schedule.

If there are no run times programmed for the selected schedule, pressing START/ADVANCE has no effect.

After the schedule has started or advanced, the controller will switch to Schedule Monitor mode.
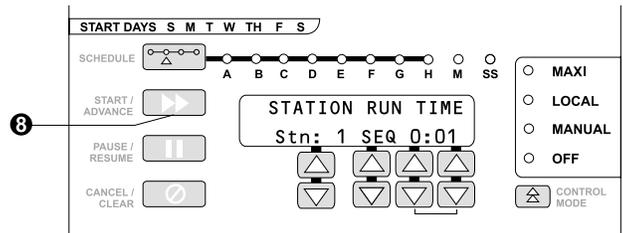
Optional Station Switches

Station switches are an optional feature available on the MSC+ controller. Station switches give you the option of turning individual stations ON or OFF, or letting them water automatically, depending on watering needs.

Station switches are numbered consecutively (1 – 8) from the top of the first Output Station with switches Module (OSM-S). The second OSM-S controls stations 9 – 16, and so on. Each switch number is imprinted on the OSM-S (left of the switch).

❶ To run stations automatically, place the switch in the AUTO position. The station switch LED remains out and the station will water for the run time programmed into each schedule.

❷ To prevent a station from watering, place the station switch in the OFF position. The station switch LED remains out and the station will not water, even if it has run time programmed into any schedule.

❸ If a station needs extra watering, place the switch in the ON position. The station switch LED lights and the station begins watering immediately. The station will continue watering until you move the switch back to the AUTO or OFF position.
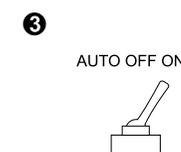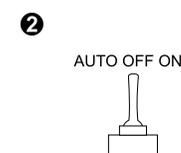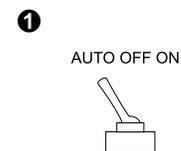
Controller Operation

Adjust Water Budget

The Water Budget feature lets you increase or decrease the run times of all stations on a schedule by a selected percentage. You can set the percentage from 0 to 200%, in 5% increments. Each schedule can have a different water budget percentage.

You can use Water Budgeting to cut back watering during cool winter months, or to increase watering during warmer weather, without reprogramming station run times. You can also use the 0% setting to temporarily shut off a schedule.

Water Budget percentages are calculated on the normal programmed run times for each station. For example, if a station is programmed to run for 10 minutes, and you set the Water Budget to 80%, the station will run for 8 minutes (80% of 10 minutes). If you set the Water Budget to 120%, that same station would run for 12 minutes (120% of 10 minutes).

❶ Press the WATER BUDGET button. The LED and the last selected schedule LED both light. Press the SCHEDULE button to select the schedule whose Water Budget percentage you want to view or change.

❷ The LCD shows the water budget percentage for the selected schedule (the default is 100%). Press the arrow keys to change the water budget percentage in 5% increments (from 0% to 200%).

❸ If you want to use the same water budget percentage in another schedule, press COPY STORE. Then press the SCHEDULE button to select the desired schedule and press COPY PASTE to enter the percentage into the other schedule.
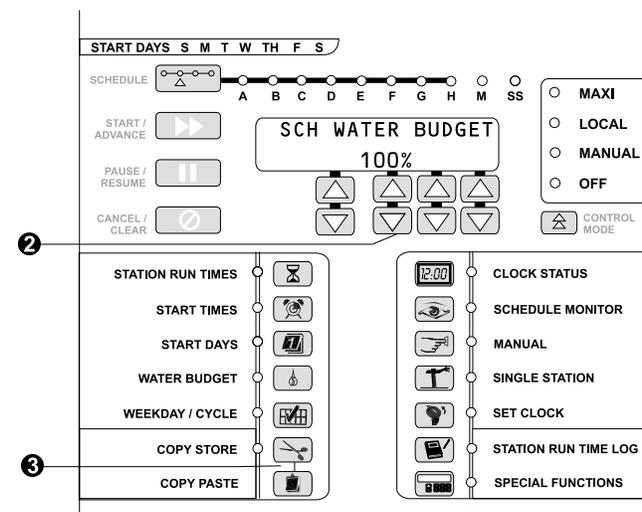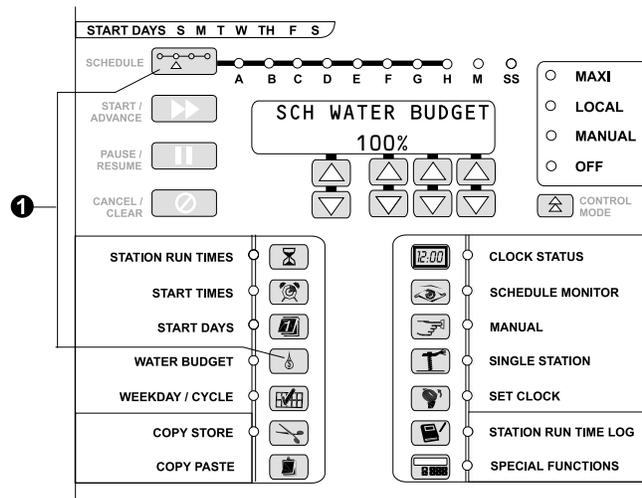
Schedule Monitor

You can use the Schedule Monitor function to monitor the status of watering schedules.
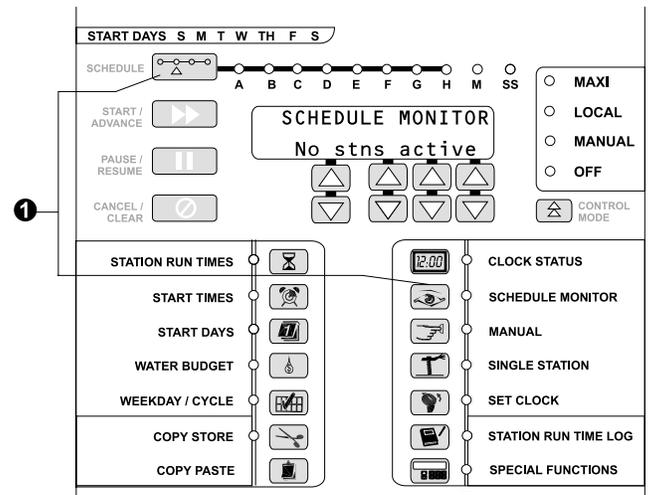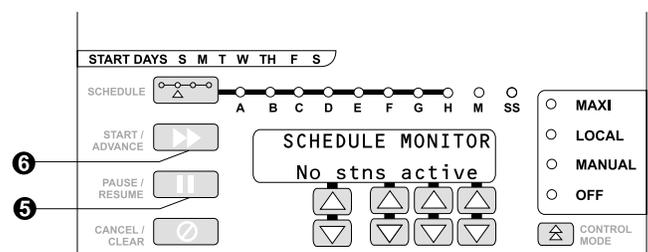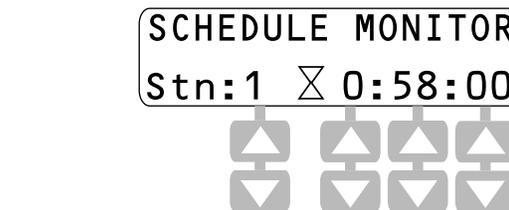
❶ Press the SCHEDULE MONITOR button. The LED and the last selected schedule LED both light. Press the SCHEDULE button to select the schedule you wish to monitor. If there are no active (currently watering) stations on the selected schedule, "No stns active" appears in the LCD.

❷ The Station LEDs (1 – 48) for that schedule light as described in "Clock Status Mode." If you selected the Single Station (SS) schedule, the station LEDs light to show which of the 48 stations are active.

❸ Line 2 of the LCD displays the schedule's first active station and its remaining run time. To monitor other stations, use the column 2 arrow keys. If a station is stacked (waiting to run), an hourglass figure will appear in line 2. Pressing the START/ADVANCE button advances the schedule to the next station.

❹ Columns 2, 3, and 4 display the remaining run time in hours, minutes, and seconds. The run time can be changed for this watering cycle using the column 2, 3, and 4 arrow keys. This run time change will not affect the schedule's permanently programmed run time.

❺ Pressing PAUSE / RESUME will pause the selected schedule, and a pause symbol will appear on line 2. While paused, the run time left on the active stations will not be affected. To resume the schedule, press PAUSE / RESUME again.

❻ If there are no active stations on the selected schedule, "No stns active" appears in the LCD. You can start an inactive schedule by pressing the START / ADVANCE button.

**7** If multiple schedules are active, their corresponding Schedule LEDs will all be lit. The selected schedule's LED will be solidly lit. Flashing LEDs indicate active schedules that are not currently on display.

8 If you selected the SS schedule, the station LEDs indicate which stations are active. Use the column 1 arrow keys to select the station to be monitored or changed. Use the column 2-4 arrow keys to change the station's run time, if desired.

9 Pressing the CANCEL / CLEAR button while in Schedule Monitor mode will cancel only the currently operating start number and currently selected schedule. You must repeat the procedure to cancel each subsequent stacked start.
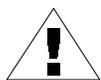
⚠ **NOTE:** A lightning bolt icon in the center of the LCD indicates that the selected station has an over current condition.
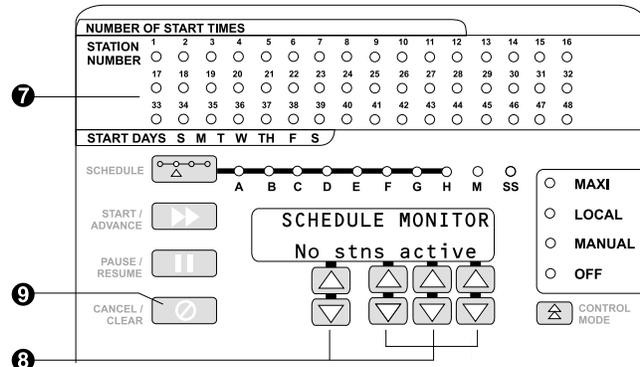
Manual Operation

The Manual (M) schedule allows either the sequential or simultaneous operation of up to 16 valves or stations at once (including Master Valve). Sequential (SEQ) operation means all manually started stations run in sequence, one after the other. Simultaneous (SIM) operation means all stations run at the same time.

For manual operation, you must select each station, enter the run time, and start the station. The station(s) will begin watering immediately.

Once 16 valves are in operation, any additional stations started will stack (wait) until an active station has finished watering.

1 Press the MANUAL button. The Manual LED and schedule M LED both light. The Station LEDs (1 – 48) will also light as described in the "Clock Status Mode" section.
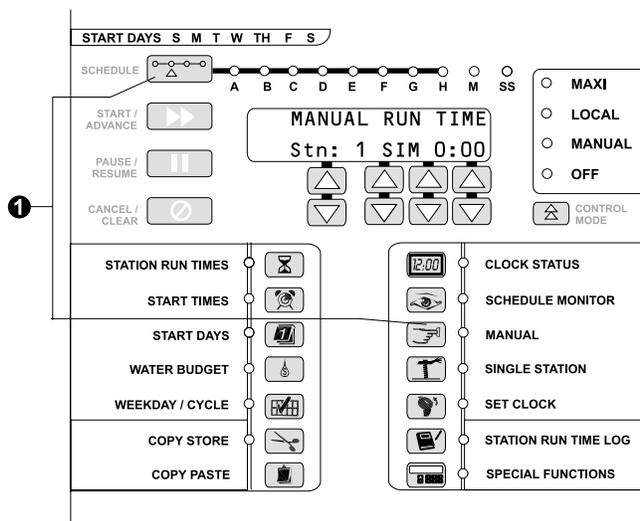
❷ Station 1 appears in the display (indicated by the flashing number "1"). To select another station, press the column 1 arrow keys until the desired station appears in the display.

❸ If the schedule is inactive, column 2 displays the station's operating mode (SIM for simultaneous or SEQ for sequential). This mode applies to the entire schedule, You can change modes by using the column 2 arrow keys. The mode cannot be changed once the schedule starts.

❹ If the selected station is active, line 2 of the LCD displays "Active" and does not allow programming changes. You can only add, delete, or change a run time by using the Schedule Monitor function.

❺ If the station is inactive, the run time appears in columns 3 and 4. Press the column 3 and 4 arrow keys to set a run time, in hours and minutes, up to a four hour maximum.

❻ Press the START / ADVANCE button to begin a station's manual irrigation. The LCD will show the station first as "Waiting" and then as "Active." The LCD will not display the run time or count down as the station runs. When a station finishes running, the LCD will show the operating time that was entered for it.
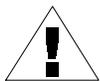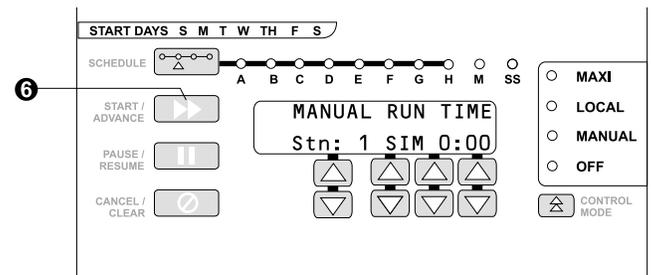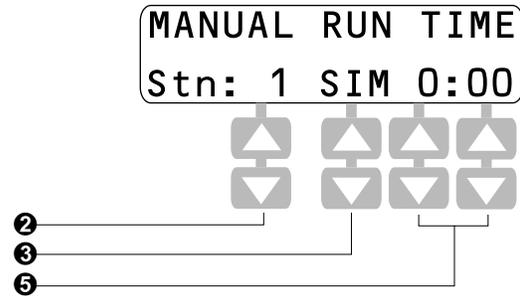
⚠ **NOTE:** If you press START / ADVANCE without entering a run time, the station will water for a default run time of three minutes.

❼ If you want to run multiple stations, continue entering run times for additional stations. Press START / ADVANCE after entering each station's run time.
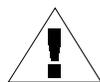
⚠ **NOTE**: If you start more than 16 valves, the additional stations will "stack" behind the original 16 and will wait for an active station to finish watering before they begin.

❽ The Copy Store function is a quick way to enter the same run time into more than one station. Press COPY STORE to save the displayed run time in memory. Press the column 1 arrow keys to select the desired station and press COPY PASTE. Then press START / ADVANCE. The stored run time can be pasted into as many stations as desired.
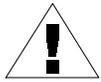
> **NOTE:** Once you start a manual schedule, you can only delete or change a station run time by using the SCHEDULE MONITOR function. Pressing CANCEL / CLEAR in Manual mode will stop operation of ALL stations on the active selected schedule.

❾ Pressing the CANCEL / CLEAR button will stop operation of the entire Manual schedule. If the selected station is not active, CANCEL / CLEAR also clears the time display.
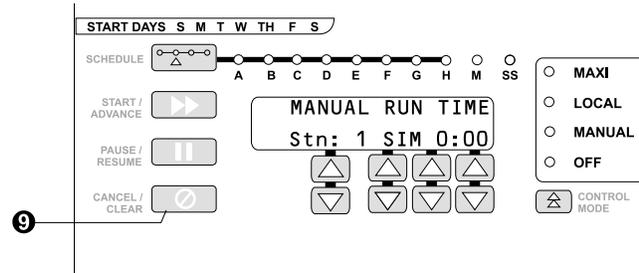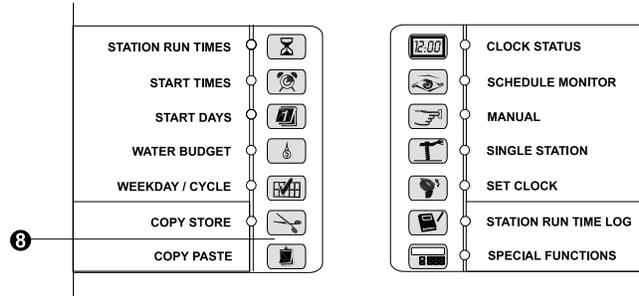
Single Station Operation

The Single Station (SS) schedule lets you individually run any of the controller's 48 stations (depending how many stations are installed on your system). SS schedules allow you to program run times and automatic start times into a station, as if each station were a separate schedule.

"SS" schedules can operate a combined maximum of 16 valves (including a Master Valve).

❶ Press the SINGLE STATION button. The Single Station LED and the SS Schedule LED both light. The Station LEDs (1 – 48) also light (as described in the "Clock Status Mode" section).

❷ Station 1 appears in the LCD. To select another station, press the column 1 arrow keys until the desired station number appears.

❸ If the station is inactive, the LCD shows the run time in columns 3 and 4. Press the column 3 and 4 arrow keys to set the station's run time in hours and minutes (up to a four-hour maximum).
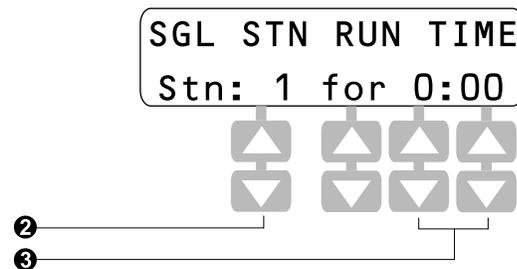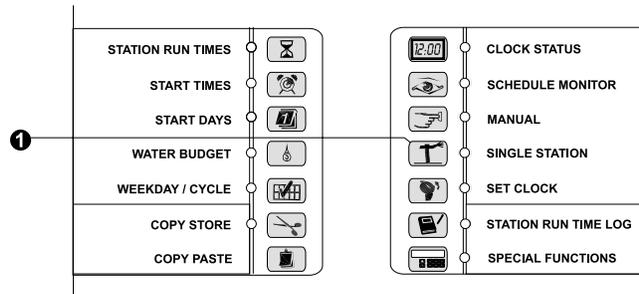
➍ To begin station irrigation, press the START / ADVANCE button. Pressing the CANCEL / CLEAR button will clear the time display.

➎ If the station is active, the LCD displays "Active" and will not allow programming. Pressing the CANCEL / CLEAR button will stop the operation of the selected schedule or station.

➏ If a Water Budget percentage other than 100% exists, the Water Budget LED will blink.

➐ The PAUSE / RESUME button affects only the selected station.
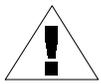
> **NOTE**: An individual station can be resumed even if the whole schedule was paused in Schedule Monitor mode.

Station Run Time Log

The Station Run Time Log lets you view the total time (in hours and minutes) that a selected station has operated.

➊ To view run time logs, press the STATION RUN TIME LOG button. The LED will light. A solid red light on any Station LED indicates that the station has log time accumulated.

➋ The display shows the station number and the amount of time in hours, minutes, and seconds that the station has operated (this time cannot be changed). Press the column 1 arrow keys if you want to view the log time for other stations.

➌ The maximum log time is 18 hours. Stations with accumulated run time greater than 18 hours will display ">18:00:00." Pressing the CANCEL / CLEAR button will reset ALL station log times to 0:00:00.
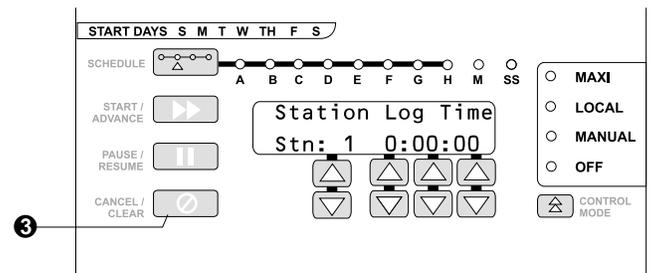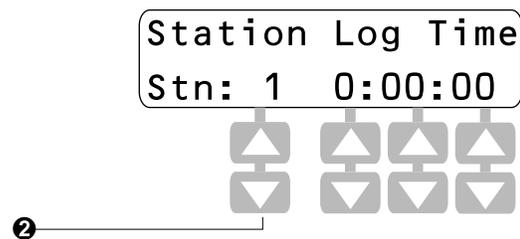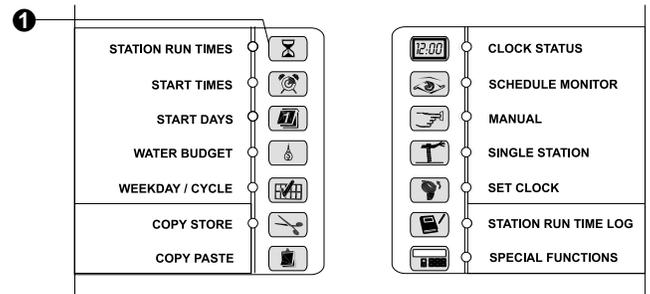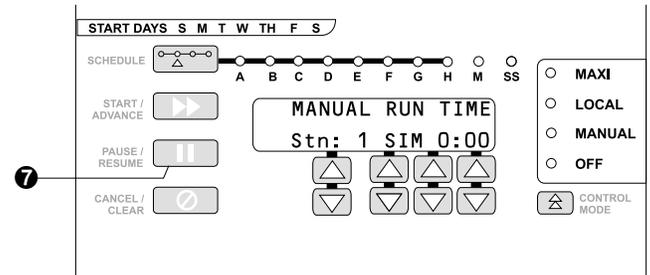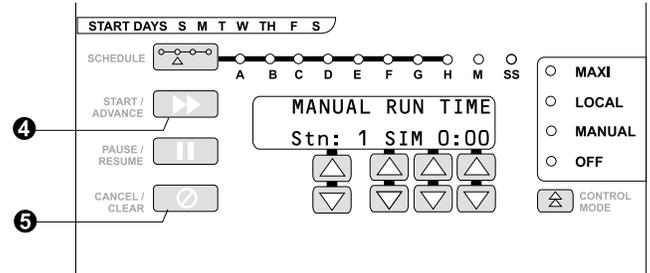
Special Controller Functions

The MSC+ controller's Special Functions feature allows option changes without dedicated buttons.

Press the SPECIAL FUNCTIONS button to cycle through all of the Special Functions. The selected function appears in the display. The description of the function is defined in the display, and you use the arrow keys to enter information. You can press the CLOCK STATUS button at any time to exit Special Function mode.

The Over Current Log is the only Special Function you can change without entering a numerical "passkey." Other Special Functions require you to enter a passkey number, as explained in "Passkey Access."

Over Current Log

The Over Current Log shows stations that have experienced an over current condition (an excess of 4.8 amps of valve current). This function also allows you to clear the Over Current Log.

NOTE: You can enable or disable detection of over current conditions using the procedure described in "Over Current Control."

Any stations shown by the Over Current Log will not operate until the over current condition has been removed from the station(s) and the log has been cleared.

❶ To view the Over Current Log, press the SPECIAL FUNCTIONS button once. Line 2 of the display says "Press Cancel to Clear Log."

❷ The Station Number LEDs show the Over Current Log. A fast-blinking LED on any station indicates that the station has experienced an over current condition.

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❸ To reset the log for all stations, press the CANCEL / CLEAR button. The stations will return to normal activity (as long as the over current condition has been corrected). Otherwise, the stations will appear on the Over Current Log again the next time they are active.

❹ Press the SPECIAL FUNCTIONS button to advance to the next special function screen (Set Up Passkey).

Passkey Access

The Passkey Access feature allows the entry of two numeric "passkeys" in the display, which allow different levels of Special Function access.

Passkey 538

The User Options Passkey (538) allows you to change the options described in the "End-User Passkey (538)" section. Without entering this passkey, you can view these options, but not change them.

User options include functions such as setting the number of valves per station, entering satellite ID information, changing the LCD display language, and other special functions. Each of the functions has a factory default setting. Consult the "End-User Passkey (538)" section to determine which of these functions you may need to change for your installation.

Passkey 627

The Production Testing Passkey (627) allows you to access functions described in the "Production Tests" section. You must enter passkey 627 to access these functions.
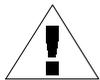
⚠ **NOTE**: Production Tests are designed to facilitate production and field testing and are not used for day-to-day operation. You do not normally need to perform these tests unless you experience a problem with the controller.
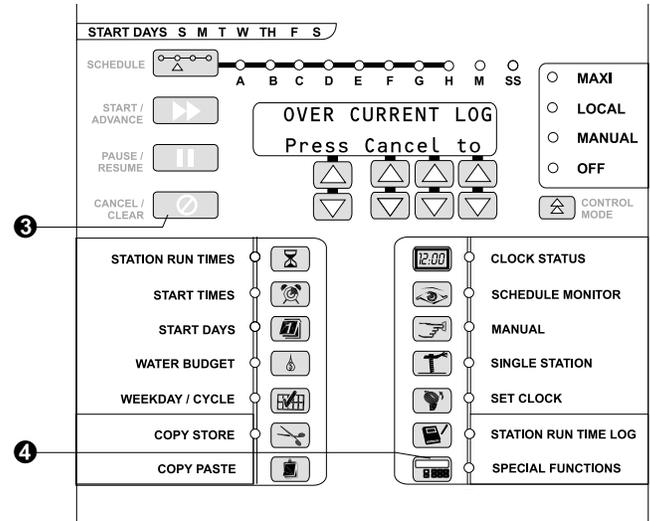
Accessing the Set Up Passkey Screen

To enter passkey 538 or 627, you must access the "Set Up Passkey" screen.

❶ From the "Over Current Log" screen, press the SPECIAL FUNCTIONS button again (a total of twice). The "Set Up Passkey" screen appears.

❷ Press the column 2, 3, and 4 arrow keys to enter the desired passkey number.

❸ The 538 and 627 passkeys are the only two combinations that will allow access to the subsequent Special Functions.

> **NOTE**: A passkey remains in effect only until the MSC+ returns to Clock Status mode.
>
> Refer to page 33 for instructions on passkey 627.

❹ Pressing the CANCEL / CLEAR button from the "Set Up Passkey" screen changes all passkey columns back to zero. This is one way to prevent further changes from being made. You can also press the CLOCK STATUS button to exit the "Set Up Passkey" screen and return to Clock Status mode.

❺ If you entered passkey 538, press the SPECIAL FUNCTIONS button to advance to the first end user special function (Valves per Station).

End-User Passkey (538)

Entering passkey 538 allows you to change the functions described in this section. Remember, you can view these Special Functions without entering a passkey, but to change them you must enter passkey 538 on the "Set Up Passkey" screen.

You can press the SPECIAL FUNCTIONS button to cycle through the end-user Special Functions until you reach the function you wish to view or change.
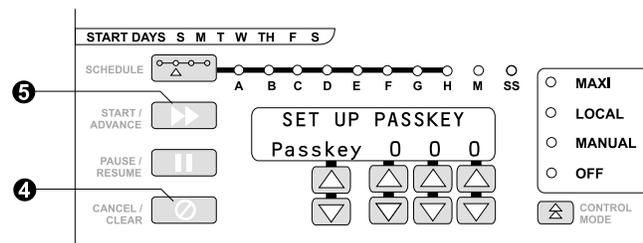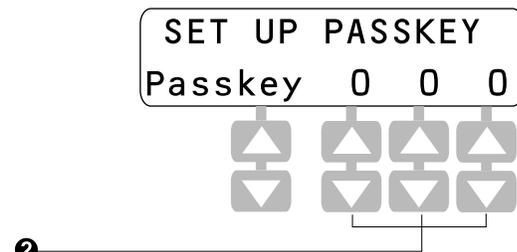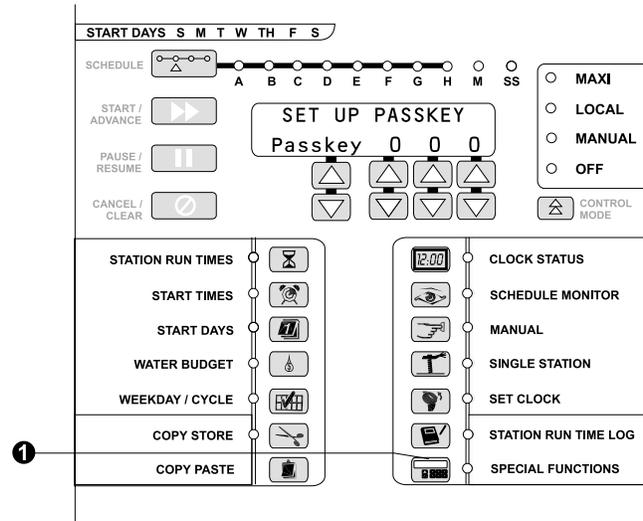
Valves Per Station

The valves per station function lets you enter the number of valves installed per station. This information determines how many stations can safely be turned on without tripping the circuit breaker or Over Current function. You can also use this function to turn the Master Valve ON or OFF.

❶ After entering passkey 538, press the SPECIAL FUNCTIONS button again from the "Set Up Passkey" screen. The "Valves / Station" screen appears, showing the station and the number of valves assigned to that station (the default is 1).

❷ Press the column 1 arrow keys to select the station number. Then press the column 4 arrow keys to assign a number of valves to the selected station. The maximum number of valves you can assign to any one station is four (4).

> **CAUTION**: Depending on your system, installing too many valves per station may cause premature pipe wear due to water hammer impact caused by shutting down several valves simultaneously.

❸ The Master Valve appears at the end of the station number array as "MV." To turn it on, set the number of valves to 1 (the default number for Master Valves is zero).

> **CAUTION**: If you assign a number greater than 1 to the Master Valve, you will reduce your station operating capacity.

STATION RUN TIMES			CLOCK STATUS
START TIMES			SCHEDULE MONITOR
START DAYS			MANUAL
WATER BUDGET			SINGLE STATION
WEEKDAY / CYCLE			SET CLOCK
COPY STORE			STATION RUN TIME LOG
COPY PASTE			SPECIAL FUNCTIONS

```
Valves / Station
Stn: 1  Valves:1
```
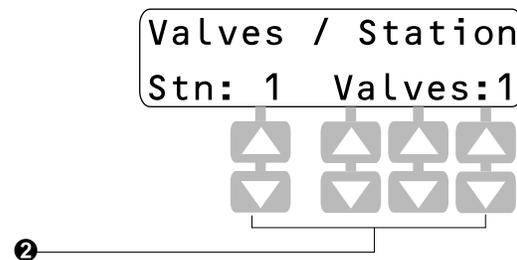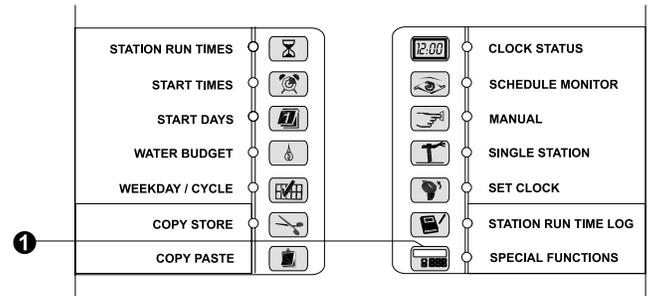
Satellite Identification Information

The MSC+ controller can be used in a MAXI central control system. To do this, the MSC+ must be set to respond to channel ID numbers (each 24 stations on the controller is called a "channel"). There are two channels, A and B. Channel A control stations 1 – 24. Channel B controls stations 25 – 48.

Both channels are programmed the same way, except that each must be assigned a unique ID number. The available ID numbers scroll from 1 through 28.

⚠ **NOTE**: Channel B is not visible in the display unless you have more than 24 stations (3 OSMs or 3 ROMs) installed.

The MSC+ can also be programmed to respond to a Links Master unit. To do this, set Channel A to "LM" for a central unit, or to "LMX" for an expansion unit.

For the MSC+ to operate as a satellite, the Control Mode must be set to MAXI. In any other mode the MSC+ will not respond to commands from a Rain Bird central control or Links Master.

❶ Press the SPECIAL FUNCTIONS button again from the "Valves / Station" screen. The "Satellite ID" screen appears, displaying channel numbers on line 2. The default setting is 0 (meaning the interface is inactive).

❷ To set Channel A, press the column 3 arrow keys until the desired ID number (1 – 28) appears in the display. The controller will now respond to this ID number for Channel A. Also, Channel B will appear following a slash (/).

❸ To set Channel B, press the column 4 arrow keys until the desired channel number (1 – 28) appears in the display. The controller will now respond to this ID number for Channel B.

⚠ **NOTE**: The Channel B ID number must be different from the Channel A ID.
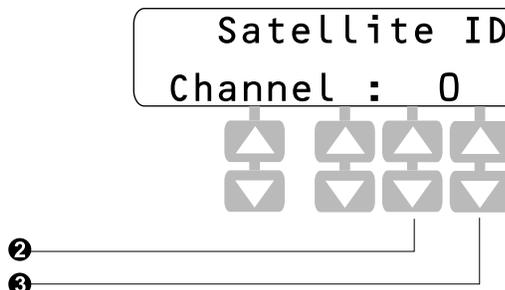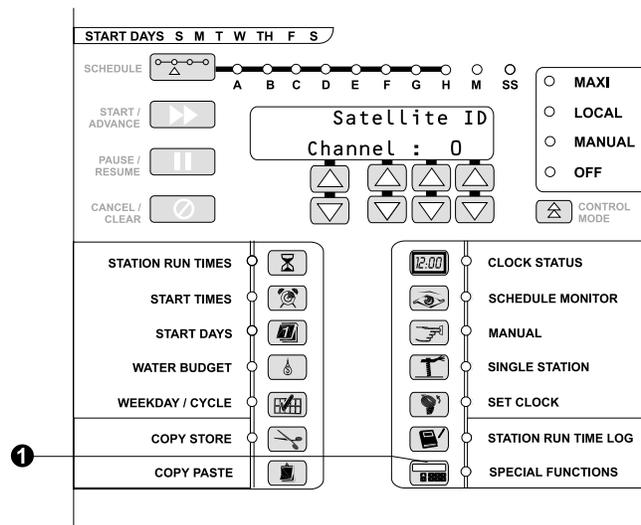
❹ When you are using a Rain Bird central control system, the channel numbers programmed into the MSC+ must correspond to the channel numbers in the Rain Bird central control database.
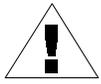
⚠ **NOTE**: Rain Bird central control software regards these channels as if they are two separate satellites, even though there is just one MSC+ controller present.

❺ When you are using a Links Master unit, the satellite address must be set to LM for a central unit or LMX for an expansion unit. Satellite schedules A, B, and C respond to central unit group control modules 1, 2, and 3 respectively, as follows:

- When the central unit gives an IRRIGATION start, the corresponding satellite schedule will irrigate for the time programmed on the satellite controller.

- When the central unit gives a SYRINGE start, the satellite controller will irrigate according to the schedule programmed on the central unit.

Display Language Option

The display language option lets you change the language used in the MSC+ controller's LCD display (the default is English). Other available language choices are: Spanish, French, Japanese, Italian, Dutch, German, and Portuguese.

❶ From the "Satellite ID" screen, press the SPECIAL FUNCTIONS button again. The "Display Language" screen appears, showing the currently selected language.

❷ Press any column's arrow keys to scroll through the language options until the desired language appears in the display. All LCD screens will then appear in the selected language.
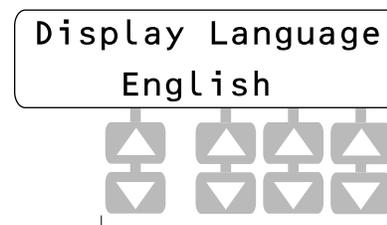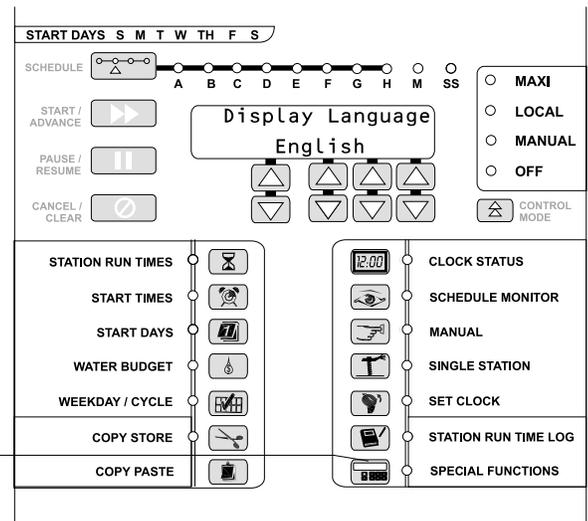
Station Location

The station location function lets you add text describing a station's location. It also lets you enable or disable display of this text. When the text is turned on, the display alternately flashes the station's location description anytime a station number appears.

❶ From the "Display Language" screen, press the SPECIAL FUNCTIONS button. The "Station Location" screen appears, showing the station number, display status (the default is OFF), and the station location.

❷ Use the column 1 arrow keys to select a station number. Column 2 arrows toggle between ON and OFF to choose the text display status for that location.

❸ Column 3 displays the area of the golf course. There are five possibilities: GRN (green), TEE, FWY (fairway), RGH (rough), and OTH (other). Press the column 3 arrow keys to assign the station an area.

❹ Column 4 displays the hole or area number corresponding to the location, ranging from 1 to 99. Press the column 4 arrow keys to assign the station's hole or area number.
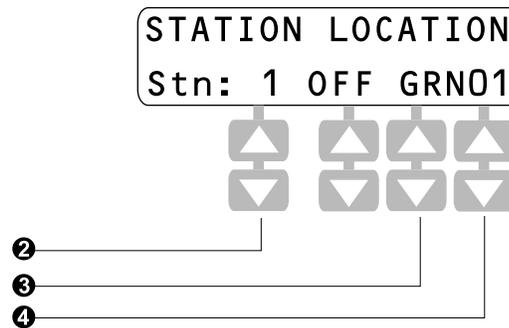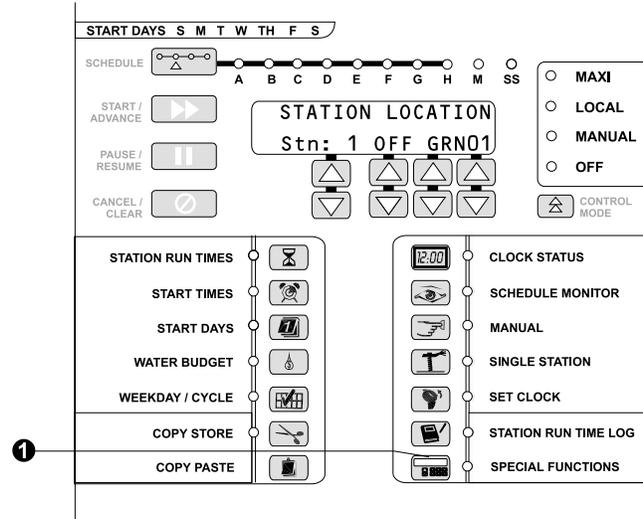
Relay Output Module Test

The relay output module test helps isolate any problem with the controller's Output Station Modules (OSMs).

❶ From the "Station Location" screen, press the SPECIAL FUNCTIONS button. The "Relay Board Test" screen appears. Line 2 of the display reads "Press Start."
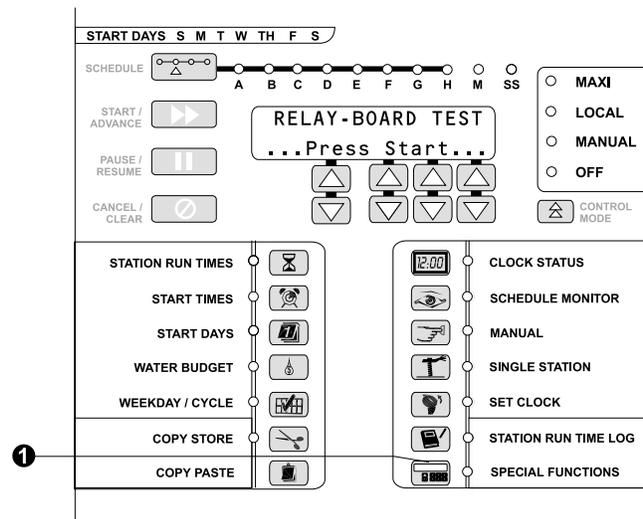
❷ Press the START / ADVANCE button to begin the test. The display shows all Output Station Modules (OSMs) that have been detected.

The display will identify the boards by number. Starting at the top of the controller, the boards are numbered from 1 through 6. Board #1 controls stations 1-8, board #2 controls stations 9-16, and so on.
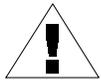
NOTE: If the controller has Relay Output Modules (ROM8s) installed (mixed with OSMs or only ROM8s), the LCD will scroll "*Error * Incompatible OSMs installed." In this case, you cannot use the OSM Test Screen to help diagnose OSM problems. (This applies to all controllers manufactured after August, 2001).

Internal Self Test

The internal self test function tests the controller's internal memory, hardware, and power-up display.

❶ From the "Relay Board Test" screen, press the SPECIAL FUNCTIONS button to display the "Self Test" screen. (If the LCD displays "Relay Board Test Found 1, 2," press the SPECIAL FUNCTIONS button once to return to the "Relay Board Test" screen. Then press SPECIAL FUNCTIONS again to enter the "Self Test" screen.

❷ Press the START / ADVANCE button to begin the test. The controller will go through its power-up test procedure and display any failures in the LCD. Then the controller will return to Clock Status mode. If the Self Test shows any failures, contact your Rain Bird distributor.
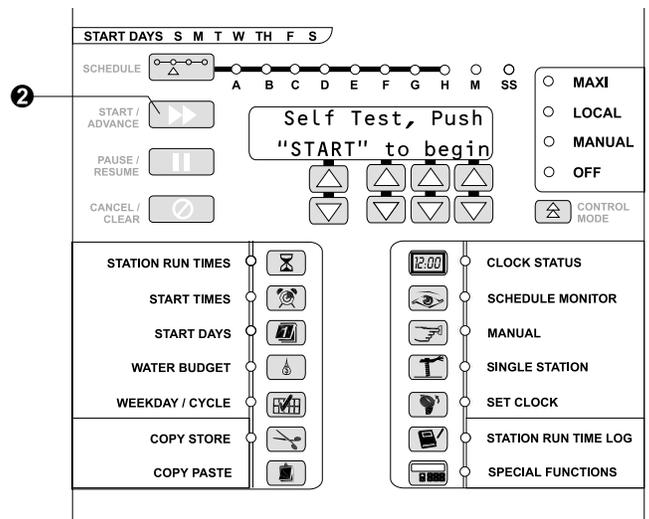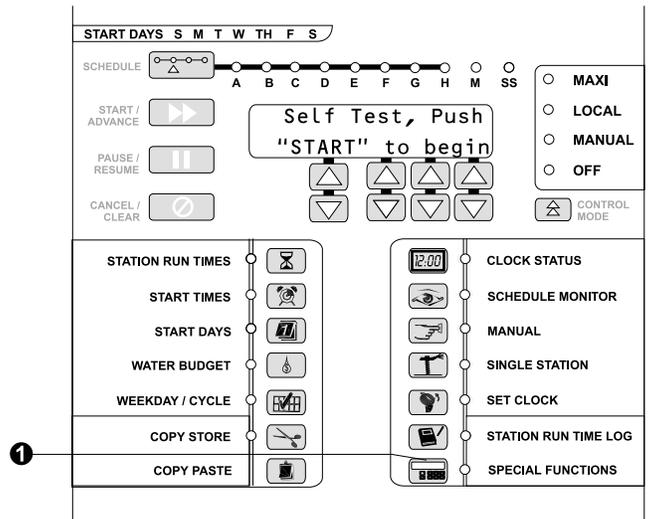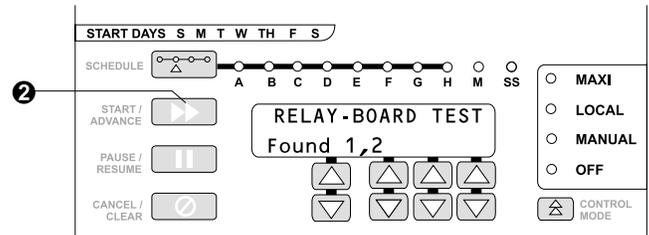
Over Current Control

The over current control lets you enable or disable the MSC+ controller's electronic over current control. If the control is disabled, the MSC+ responds to an over current condition by tripping the circuit breaker. If the over current control is enabled, the controller responds by electronically shutting down the conditions that caused the overload.

❶ From the "Self Test" screen, press the SPECIAL FUNCTIONS button. The "Set Over Current" screen appears.

❷ Press the column 4 arrow keys to toggle from ON to OFF (the default is ON).
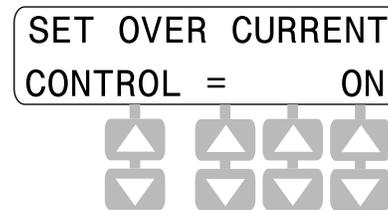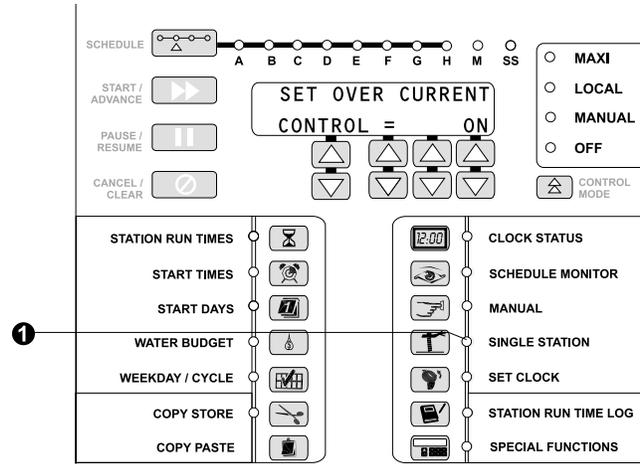
Run Time Log Automatic Clear

The run time log clear determines at what time each day the station run time log will automatically clear itself. It also allows you to set the run time log automatic clear status to OFF. This means the run time log can only be cleared manually.

❶ From the "Set Over Current" screen, press the SPECIAL FUNCTIONS button. The "Log Clear Time" screen appears, showing the current run time log clear status (the default is ON), and the time of day the log will be cleared (the default clear time is 17:00), (5 PM).

❷ To change the log clear time, make sure the status is ON (press the column 1 arrow keys to toggle between ON and OFF). Then press the column 3 and 4 arrow keys to set the desired log clear time (hour and minute).

❸ The log clear time can be disabled by pressing the CANCEL / CLEAR button. This will erase the clear time and set the status to OFF.


```
SET OVER CURRENT
CONTROL =      ON
```



```
LOG CLEAR TIME
Clr ON   @ 17:00
```
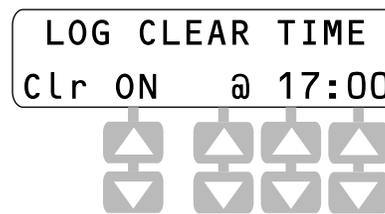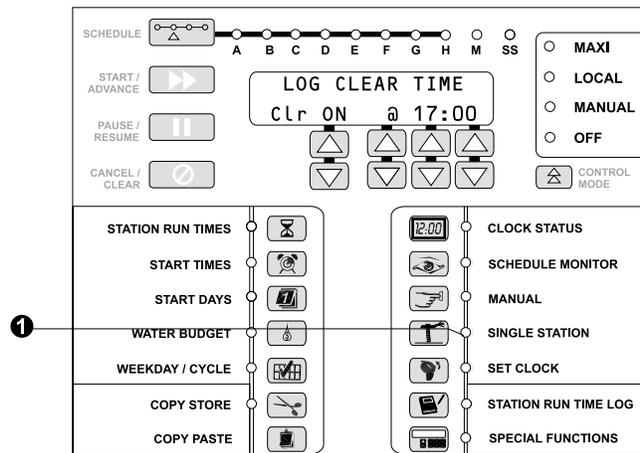
Day Changeover Time

The day changeover time determines the time of day that the MSC+ controller starts a new day. This affects the order of schedule start times.

For example, if the changeover time is 0:00 (midnight), an 03:00 start time will begin at 03:00 (3 AM) that same day.

However, if you set the changeover time to 06:00 (6 AM), an 03:00 start time would not begin until 03:00 (3 AM) the following day.

❶ From the "Log Clear Time" screen, press the SPECIAL FUNCTIONS button. The "Day Change Time" screen appears, showing the current day changeover time (0:00 = midnight).

❷ Press the column 3 arrow keys to change the hour. The default changeover time is 0:00 (midnight).
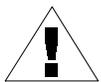
⚠ **NOTE**: You can only set the hour using this function, not the minutes.
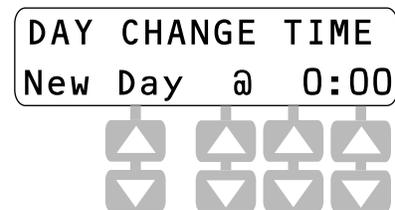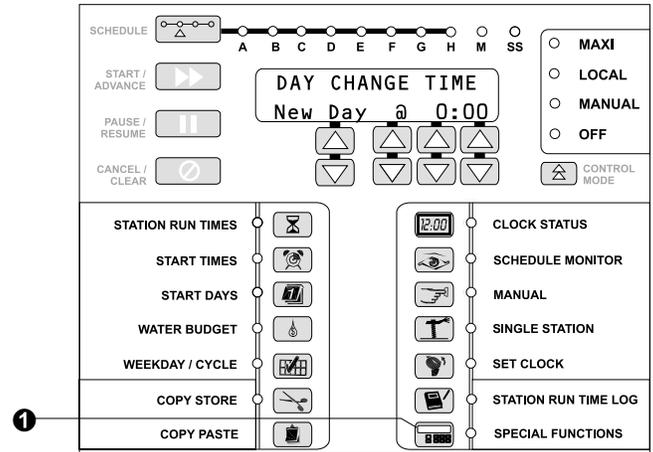
Power Fail Restart Mode

Power fail restart mode determines how the MSC+ controller will recover from a power loss. "Electronic" mode (the default) acts as if the schedule has been running during the power failure. When power is restored, the clock will be at the exact same irrigation point as it would have been if power had not failed. Irrigation will be lost, but the watering window will be maintained.

"Mechanical" mode acts as if the watering schedule has stopped and no activity had occurred during the power loss (except the time clock advancing). When power is restored, the preexisting watering cycle will pick up where it left off. Any stacked starts will still be in place, and any scheduled starts lost during the power failure will be added to the stack. No irrigation time will be lost.

❶ From the "Day Change Time" screen, press the SPECIAL FUNCTIONS button. The "Power Fail Restart" mode screen appears.

❷ Press the arrow keys in any column to toggle between Electronic and Mechanical modes.
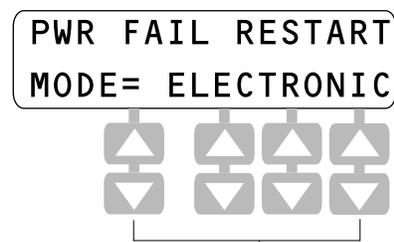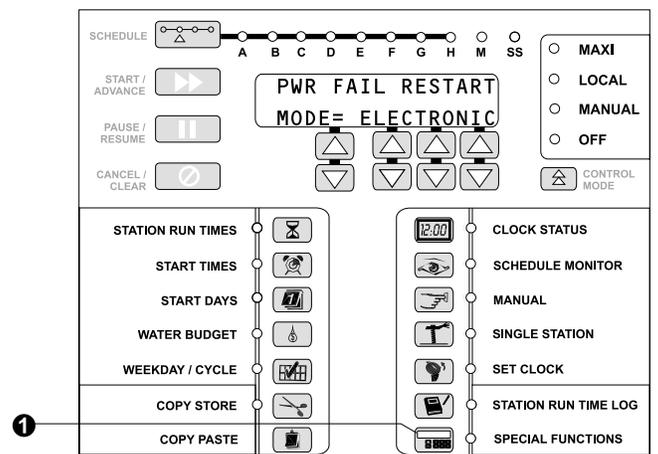
Software Revision Information

Software revision information displays revision levels of the MSC+ controller's software and the type of MAXI interface installed.

❶ From the "Power Fail Restart" mode screen, press the SPECIAL FUNCTIONS button. The "Revision Info" screen appears, showing the main logic board version (ML), the interface board software version (IF), and the type of interface (TY). (This information can be viewed, but not changed).

❷ Note the following types of MAXI interface codes:

- TY = 0 — Controller in standalone mode and there is no interface

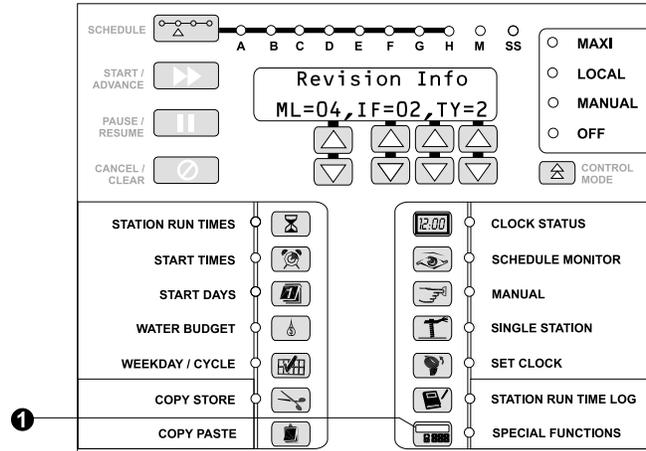- TY = 1 — Controller connected to a MAXI or Links Master 2-wire interface

- TY = 2 — Controller connected to a central control system via a wireless interface

Sensor Select

The sensor select function lets you select the type of wiring installation (NC for Normally Closed or NO for Normally Open) and status (ON or OFF) of any rain or moisture sensor system connected to the MSC+ controller.

❶ From the "Revision Info" screen, press the SPECIAL FUNCTIONS button. The "Sensor Select" screen appears.

❷ Line 2 displays the sensor status (ON or OFF). Press the column 1 arrow keys to change the sensor status (the default is OFF). If the sensor status is OFF, the controller will ignore all sensor input. Sensor status ON means the controller will recognize sensor input.

When the sensor system detects sufficient moisture to suspend watering, all current watering schedules on the controller will be cancelled, and the Clock Status screen will flash a "Sensor Active" message.
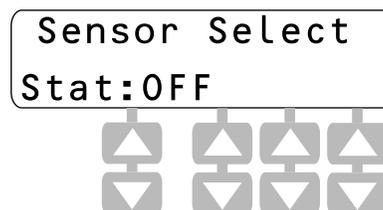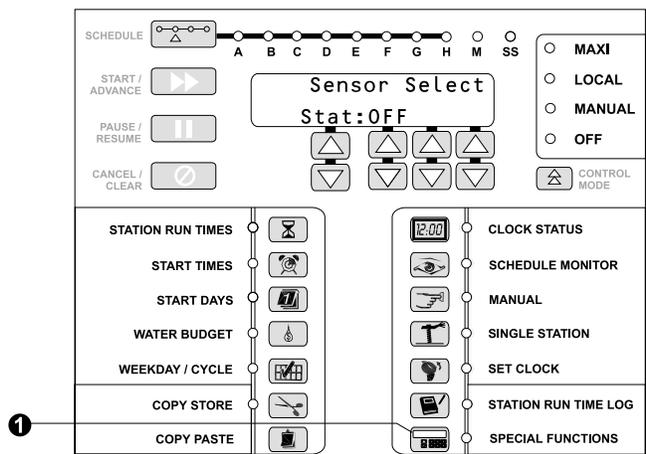
❸ When sensor status is ON, line 2 will also display the sensor installation type, NC (the default), or NO. Press the column 4 arrow keys to select the appropriate status mode for your installation.
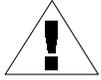
⚠️ **NOTE**: the "TYPE" column is only visible when the sensor status is ON.
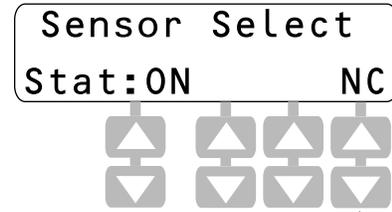
Master Valve Station Select

The master valve station select function removes or assigns Master Valve activity to or from a station. Any station that is turned ON will energize the Master Valve program when the station becomes active. (The reset default is all stations ON).

❶ From the "Sensor Select" screen, press the SPECIAL FUNCTIONS button. The "Set Master Valve" screen appears.

❷ Press the column 1 arrow keys to change the station number. Press the column 4 arrow keys to toggle between Master Valve ON and OFF for the selected station.

❸ The station LEDs light to indicate which stations are ON. The Master Valve will activate whenever any "ON" station runs.
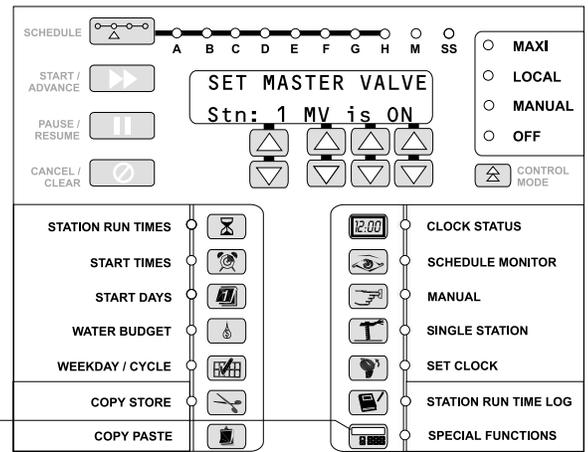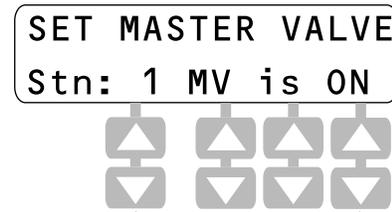
Set Satellite Group ID

❶ From the "Set Master Valve" screen, press the SPECIAL FUNCTIONS button. The "Set Satellite Group ID" screen appears.

❷ Press the column 3 arrow keys to set the satellite group ID. You can set the number from 0 (the default) to 8. Then press the SPECIAL FUNCTIONS button to advance to the "Station Limit" screen.

Station Limit

The MSC+ controller can operate as many as 16 solenoids at one time (each station can operate a maximum of four solenoids). The station limit function lets you limit the maximum number of solenoids the controller can turn ON simultaneously to a number less than 16.

The maximum number of solenoids can be set between 10 and 16. This number determines how many stations can safely be turned on without tripping the circuit breaker.

❶ From the "Set Satellite Group ID" screen, press the SPECIAL FUNCTIONS button. The "Station Limit" screen appears.

❷ Press the column 4 arrow keys to change the station limit number. You can set the maximum number of valves from 10 to 16 solenoids (at 50/60 Hz).
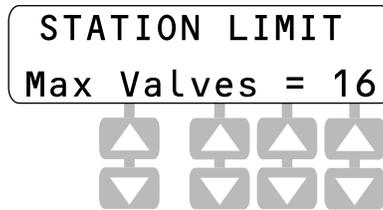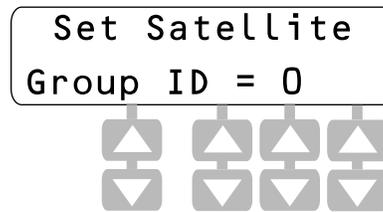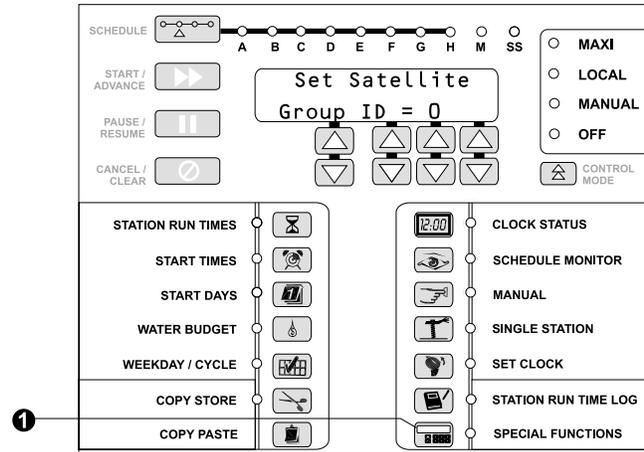
Station Current

This function displays the measured current of each station, including the Master Valve, and also shows the Total Current. The Total Current is the amount of current measured at the last time the controller was operating in normal current condition (no over current).

❶ From the "Station Limit" screen, press the SPECIAL FUNCTIONS button. The "Station Current" screen appears, showing the measured current for the first station.

❷ Press the column one arrow keys to advance through the stations (the display scrolls from station one through the Master Valve, and then the Total Current). The station LEDs indicate which logged station number is shown in the display.

❸ If the controller detects an over current or short condition on the displayed station, the screen will display the message ">Max" (greater than maximum), instead of the measured current.
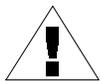
NOTE: The maximum current that each station can supply is 1.6 Amps.
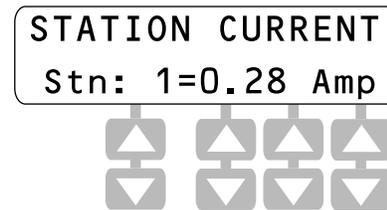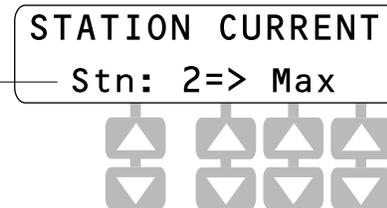
Production Tests (Passkey 627)

Production Test mode lets you run several special diagnostic tests that can help identify problems with the controller's keypad, LCD display, and other functions. You must enter passkey 627 to access and perform these tests.

Entering the Production Tests Passkey (627)

❶ Press the SPECIAL FUNCTIONS button to access the "Over Current Log" screen. Then press the SPECIAL FUNCTIONS button again (a total of twice). The "Set Up Passkey" screen appears.

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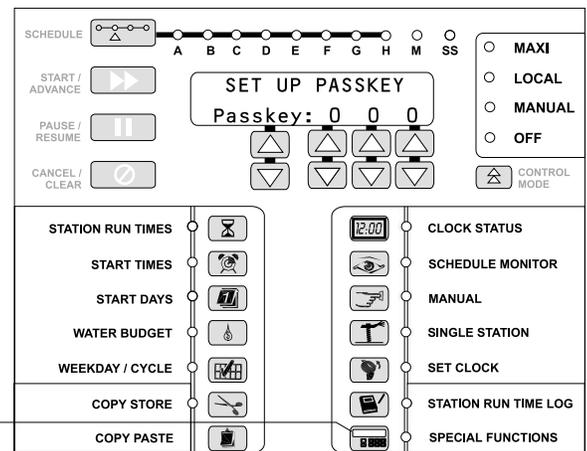
❷ Press the arrow keys in columns 2, 3, and 4 to enter passkey number 627.

⚠️ **NOTE**: A passkey remains in effect only until the MSC+ returns to Clock Status mode.

Pressing the CANCEL / CLEAR button from the "Set Up Passkey" screen changes all passkey columns back to zero. This is one way to prevent further changes from being made. You can also press the CLOCK STATUS button to exit the "Set Up Passkey" screen and return to Clock Status mode.

❸ After entering passkey 627, press the START / ADVANCE button to access the first production test screen (Key Pad Test).

❹ After reaching each production test screen, press the START / ADVANCE button to activate that test.

❺ After completing the test, press the SPECIAL FUNCTIONS button to advance to the next test. If you do not want to perform a test, simply press the SPECIAL FUNCTIONS button additional times to cycle through the tests.

⚡ **CAUTION**: The only safe way to exit Production Test mode and retain all programmed schedules is to "Warm Start" the MSC+ co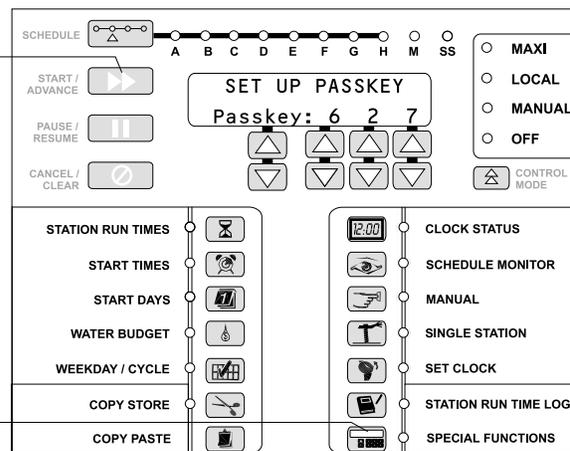ntroller (as shown on page 38). DO NOT perform a "Cold Start" (as shown on page 38) unless you want to erase all programmed schedule information and reset all controller functions to factory defaults.

SET UP PASSKEY
Passkey: 6 2 7

SET UP PASSKEY
Passkey: 6 2 7

Key Pad Test

The key pad test verifies the proper operation of the controller's front panel overlay key pad.

❶ After entering passkey 627 on the Set Up Passkey screen, press the START / ADVANCE button to enter the Key Pad Test LCD. Press the START / ADVANCE button again to begin the key pad test.

❷ Press each key on the controller's face panel. The LCD displays the name of each key as it is pressed. If any key name fails to display properly, note it and contact your local Rain Bird distributor for a service referral.

❸ After completing the test, press the SPECIAL FUNCTIONS button to exit key pad test mode and advance to the display test.
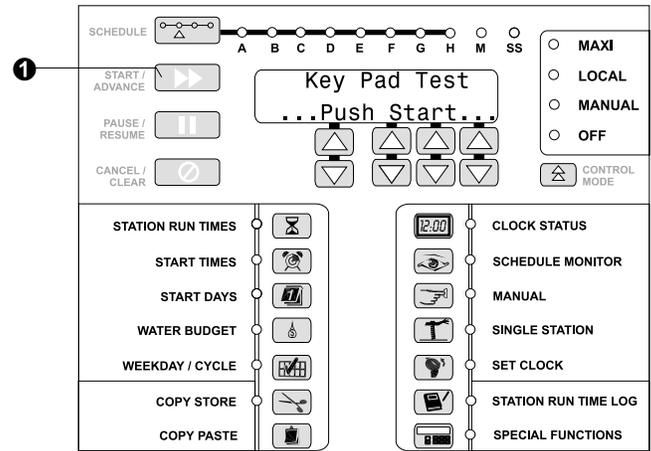
Display Test

The display test checks the proper operation of the MSC+ Liquid Crystal Display (LCD) screen.

❶ From the "Display Test" screen, press the START / ADVANCE button to begin the display test.

❷ The LCD displays all the pixels for each digit (for approximately 10 seconds). It will then display all the pixels at the same time. Watch the display and verify that the LCD is operating properly.

❸ When the test is complete, press the SPECIAL FUNCTIONS button to exit the display test and advance to the LED test.
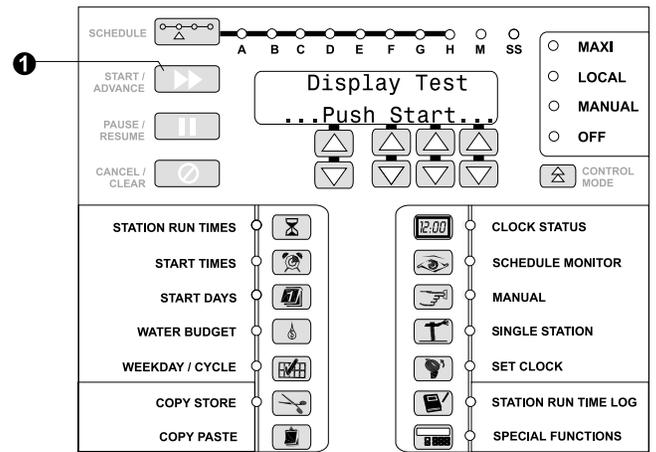
LED Test

The LED test checks the proper operation of the Light Emitting Diodes (LEDs) on the MSC+ controller's front panel.

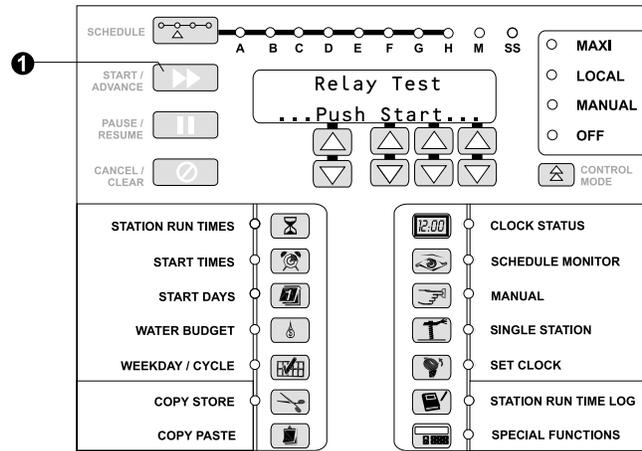❶ From the "LED Test" screen, press the START / ADVANCE button to begin the LED test. The front panel LEDs will turn on one at a time (no relays are activated). Each LED will light for about one second.

❷ Watch the LEDs and verify that each one lights properly. If any LED(s) fail to come on, note them and contact your Rain Bird distributor for a service referral. The LED test cycle will continue indefinitely.

❸ Press the SPECIAL FUNCTIONS button TWICE to exit the LED test and advance to the relay test.
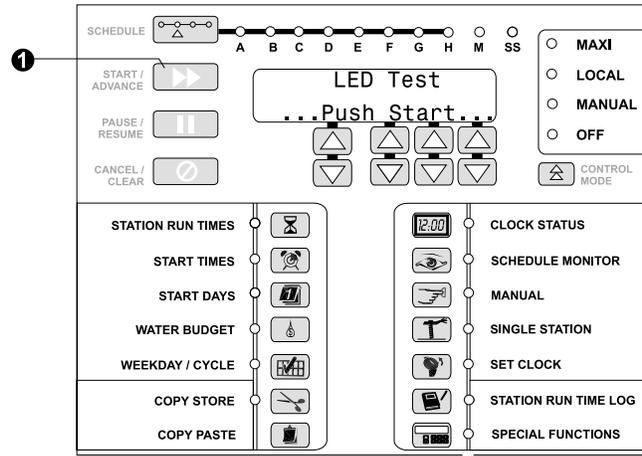
Relay Test

The relay test checks the operation of the MSC+ station output relays. (Each OSM and ROM-8 contains 8 relays; one per station).

❶ Press the START / ADVANCE button to begin the relay test.

❷ The station output relays will turn on one at a time (the Master Valve relay will remain on continuously). Each station output relay will stay on for about two seconds.

❸ Visually verify that all outputs become active and are correctly wired to the output terminal board.

❹ The relay test cycle will continue indefinitely. Press the SPECIAL FUNCTIONS button TWICE to exit the relay test and advance to the input port test.

Input Port Test

The Input Port test verifies proper rain / moisture sensor input to the MSC+.

❶ From the "Input Port Test" screen, press the START / ADVANCE button to begin the input port test. The screen should read "Input Port = 0."

❷ The technician must then provide a dry contact closure for the input between the sensor input and sensor common.

❸ As the shorted contact is supplied to the input, the "0" in the display should change to "1."

❹ After completing the test, press the SPECIAL FUNCTIONS button to exit and advance to the ROM checksum test.
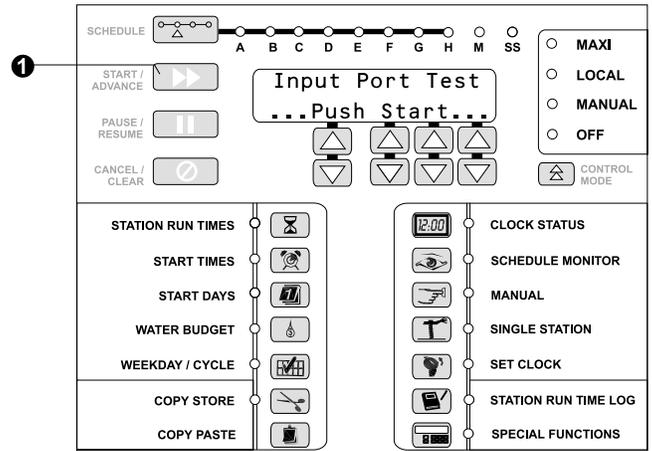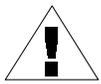

ROM Checksum Test

The ROM Checksum test checks the internal Main Logic Board ROM firmware checksum.

❶ From the "ROM Chck Test" screen, press the START / ADVANCE button to begin the test. The software adds together all byte locations in the ROM, truncates that value to the least significant byte, and displays that byte value in two hex digits in the display. This calculated value must equal the stored value in the last ROM location. It is used to verify EPROM integrity during the power-up test.

NOTE: Hex digits are numbers to the base 16 (i.e., 1 through 9 and A, B, C, D, E, and F).

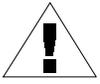❷ After completing the test, press the SPECIAL FUNCTIONS button TWICE to end the ROM Checksum test and access the "Warm Start" screen which allows you to exit Production Test mode.
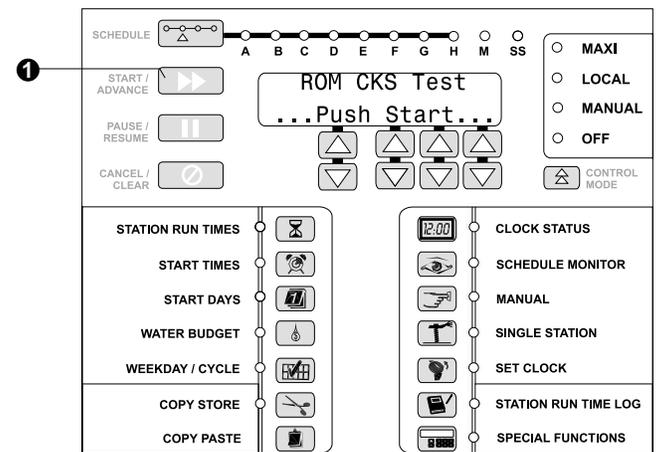
Warm Start

⚠️ **NOTE:** The "Warm Start" is the only safe exit from Production Test mode (other than turning the power off) that will not erase all programming from the controller's memory and return all settings to factory defaults.

❶ From the "ROM Chck Test" screen, press the SPECIAL FUNCTIONS button to advance to the "Warm Start" screen.

❷ Press the START / ADVANCE button to begin a Warm Start. The watchdog timer will activate and automatically reset the MSC+.

❸ During the power-up, the MSC+ will perform a self-test and then return to Clock Status mode.
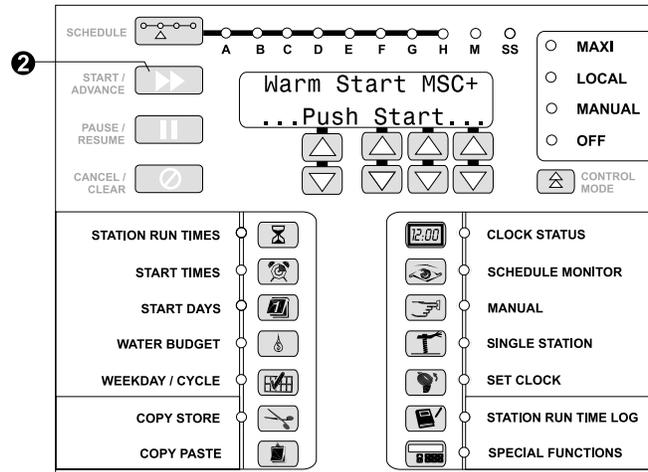
Cold Start

⚡ **CAUTION:** A "Cold Start" clears the controller's memory and resets all program variables back to factory defaults. DO NOT perform the Cold Start procedure unless you want to erase the controller's memory and reprogram all schedules.

❶ From the "Warm Start" screen, press the SPECIAL FUNCTIONS button to advance to the "Cold Start" screen. Then press the START / ADVANCE button to begin the Cold Start.

❷ The software will clear out the initialized memory checksum flags and reset the watchdog timer. Also, during the power-up test, the MSC+ will perform a "New System Setup."
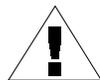
⚠️ **NOTE:** If you reach the "Cold Start" screen and do not want to erase all program memory, simply press the SPECIAL FUNCTIONS button to cycle through the production tests back to the "Warm Start" SCREEN. You can also turn the controller OFF and then back ON. When the controller powers-up it will return to Clock Status mode with its memory intact.
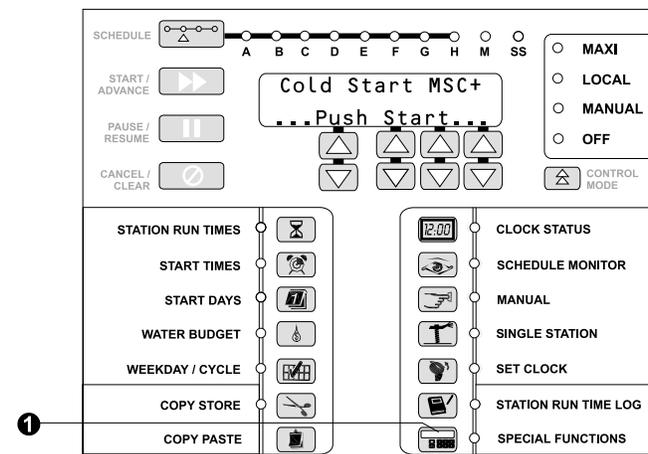
Station Current

❶ From the "Cold Start" screen, press the SPECIAL FUNCTIONS button to advance to the "Station Current" screen. This screen shows the total current draw on the system. (The "Station Current" screen will only display amps when stations have rotors attached to them).

❷ After viewing total current draw, press the SPECIAL FUNCTIONS button to cycle through the production tests until you reach either the "Warm Start" or "Cold Start" screen to exit production test mode.

```
STATION CURRENT
Total =0.000 Amp
```
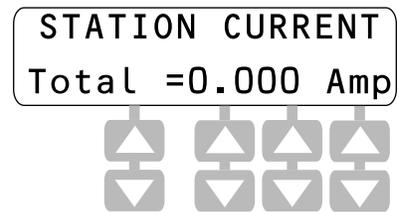
Circuit Breaker Tripped Mode

The MSC+ goes into circuit breaker tripped mode when excessive current on the station outputs trips the circuit breaker. When the breaker trips, the LCD displays a "Breaker Tripped" message, and you must reset the circuit breaker.
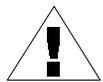
NOTE: All controller functions and buttons are inactive until you reset the circuit breaker.

❶ To reset the circuit breaker, press the circuit breaker button. The circuit breaker is located on the upper right side of the Power Interconnect board cover. The Power Interconnect board is located at the top of the mounting plate assembly inside of the controller pedestal.

When the breaker trips, the light on the lower right cover turns OFF. When the circuit breaker button is pushed, the light turns back ON, indicating the breaker has been reset.

❷ After resetting the breaker, the LCD "Breaker Tripped" message should disappear. If the breaker continues to trip, it means there is a problem with the station output wiring or with the number of solenoids (valves) per station. The problem must be identified and corrected to prevent the breaker from tripping repeatedly.

❸ To correct the problem, check the total number of solenoids (valves on each station), and make sure the correct number has been entered (see the "Valves per Station" topic in the "End User Passkey (538)" section).

CAUTION: DO NOT hold the circuit breaker in if it continues to trip. This will damage the breaker. Instead, find and repair the cause of the trip.

Adjust LCD Display Brightness

If the LCD display is not clearly visible, you can brighten it by adjusting the potentiometer on the back panel of the main logic board.

❶ Remove the four long screws from the face of the control panel and lift out the control module.

❷ Remove the four short screws on the back cover of the control module to expose the main logic board.

❸ The potentiometer is a small, white slotted device located halfway down the right side of the logic board. Use a screwdriver to adjust the LCD display brightness.

NOTES

Warning: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

Changes or modifications not expressly approved by Rain Bird Irrigation Corp. could void the user's authority to operate the equipment.

RAIN BIRD®

P/N 633251B