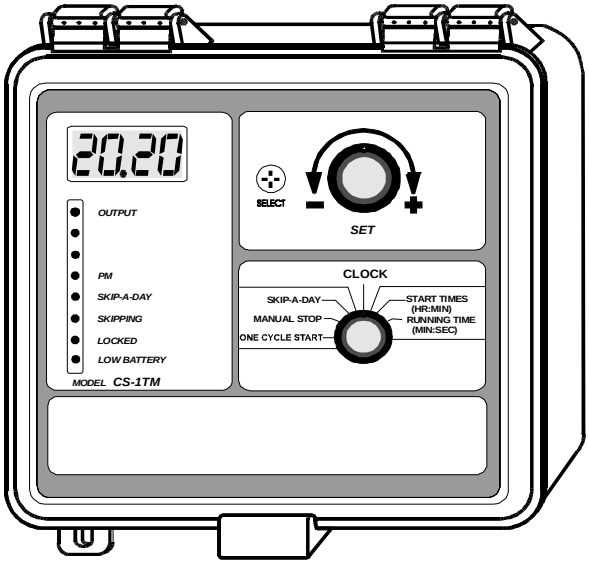
CS-1TM

24-HOUR TIMER CONTROL



CS-1TM: 24-HOUR TIMER CONTROL

❶ INTRODUCTION

The CS-1TM is a timer designed to control farm equipment. It uses an internal clock to operate up to 24 different operation cycles. At each cycle start, the timer activates a dry contact. Manual start/stop and skip-a-day functions are included. A four-digit display and a push-button make programming easy. Additional features include:

- a battery back-up for keeping time in case of a power failure
- overload protection on the output
- a 115/230 VAC - 50/60Hz power supply
- an alarm output
- the unit can be connected to a computer communications module

❷ PRECAUTIONS

Although fuses at the input and outputs of the controller protect its circuits in case of an overload or overvoltage, we recommend installing an additional protection device on the controller's supply circuit.

The room temperature where the controller is located MUST ALWAYS REMAIN BETWEEN 32°F AND 104°F (0°C TO 40°C).

To avoid exposing the controller to harmful gases or excessive humidity, it is preferable to install it in a corridor.

DO NOT SPRAY WATER ON THE CONTROLLER

❸ MOUNTING INSTRUCTIONS

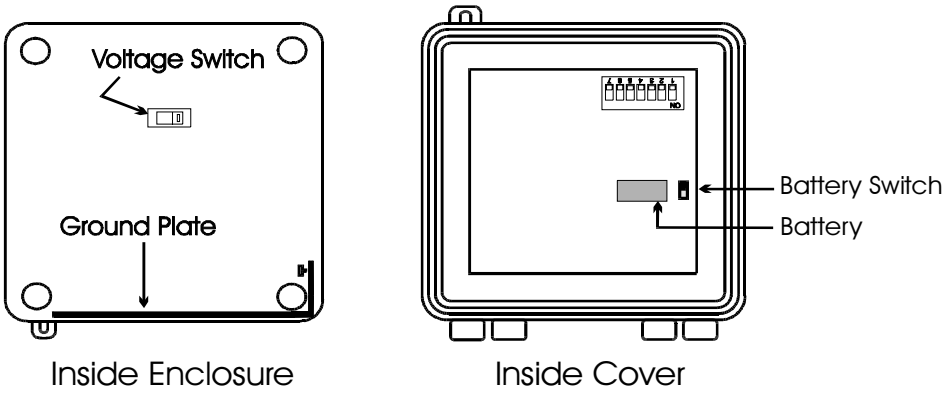
Remove the four screws on the front cover and lift the cover. Mount the enclosure on the wall using three screws. Be sure the electrical knockouts are at the bottom of the enclosure in order to prevent water from entering the controller. Insert the screws in the mounting holes provided in three corners of the enclosure and tighten. Fasten the three black caps provided with the controller onto the three mounting holes.

❹ CONNECTIONS

To connect the controller, refer to the wiring diagram enclosed with this user's manual.

⇨ Set the voltage switch to the appropriate voltage.

⇨ Use the electrical knockouts provided at the bottom of the enclosure. Do not make additional holes in the enclosure, particularly on the side of the enclosure when using a computer communications module.



⇨ If metallic cable holders are used to secure cables entering the enclosure, use the ground plate provided with the controller. Connect the ground wire to the ground stud on the plate.

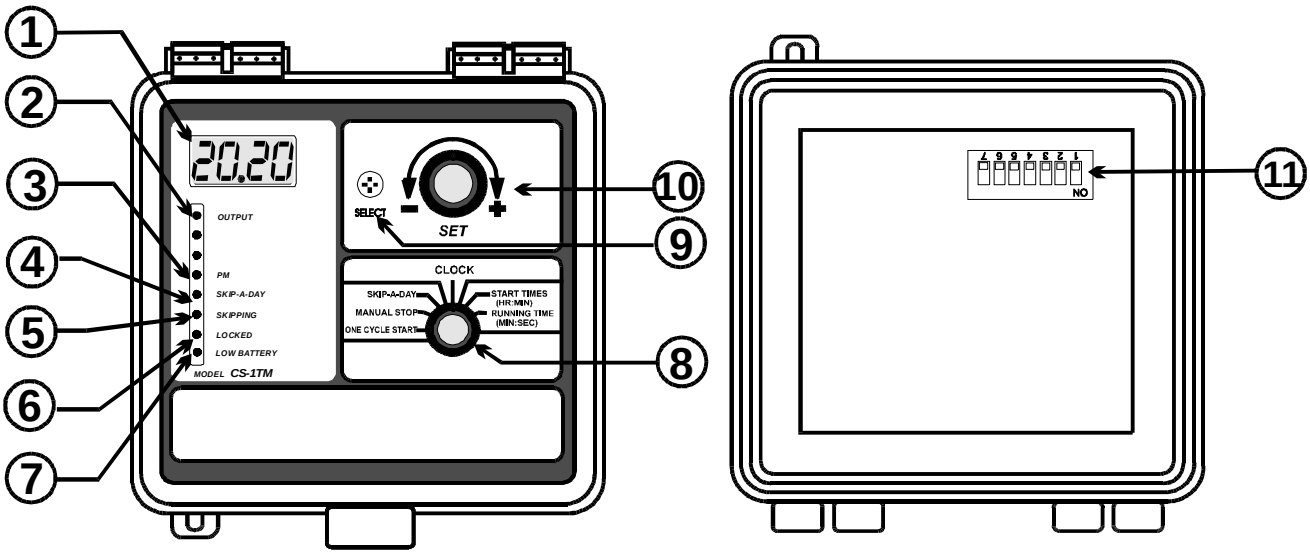
⇨ The switch near the 1/2AA Lithium battery located inside the cover must be turned on before you plug the timer into a power outlet.

⇨ Two types of alarms are currently available on the market. The first type is activated when current is cut off at the source; the other is activated when current is supplied to the input. Use the NO terminal for an alarm of the first type; otherwise use the NC terminal.

WARNING

ALL WIRING MUST BE DONE BY AN AUTHORIZED ELECTRICIAN AND MUST COMPLY WITH APPLICABLE CODES, LAWS AND REGULATIONS. BE SURE POWER IS OFF BEFORE DOING ANY WIRING TO AVOID ELECTRICAL SHOCKS AND EQUIPMENT DAMAGE.

❺ LOCATION OF THE CONTROLS



Front

Inside Cover

1 - Digital Display: Displays the clock time and other values.

2 - Output Pilot Light: Turns on when the output relay is activated.

3 - PM Pilot Light: Turns on when the current time is PM.

4 - Skip-A-Day Pilot Light: Turns on when the skip-a-day feature is activated.

5 - Skipping Pilot Light: Turns on when the current day is being skipped.

6 - Locked Parameter Pilot Light: Turns on when the parameters are locked.

7 - Low Battery Pilot Light: Turns on when the battery is low.

8 - Function Selection Knob: Used to select a function.

9 - Push-button: Used for programming timer cycles and storing parameters.

10 - Adjustment Knob: Used to set parameters values.

11 - Internal Switches:

1 - Locked / Unlocked parameters: When this switch is ON, the timer parameters are locked and can only be displayed (except the clock time).

2 - 24HR / 12HR time: When this switch is ON, the display shows 24-hour time. Otherwise, the display shows 12 hour time (AM / PM).

❻ USING THE CONTROLLER

THE DISPLAY

A flashing value on the display means that the value can be modified using the adjustment knob. Otherwise, the parameter cannot be modified. If the locked parameter switch (Dipswitch # 1) is in the ON position, no parameters can be modified (except the clock time). If after 10 seconds, no action is taken to modify a flashing value, the display stops flashing and the timer returns to a display mode. If any changes were made within this time period, they will be recorded in permanent memory.

THE CLOCK

The CS-1TM has an internal clock used for programming the timer cycles. To display the current time, turn the selection knob to the **CLOCK** position. If the internal switch #2 is OFF, the time is displayed in 12-hour format. In this case, the PM LED turns on to show PM time.

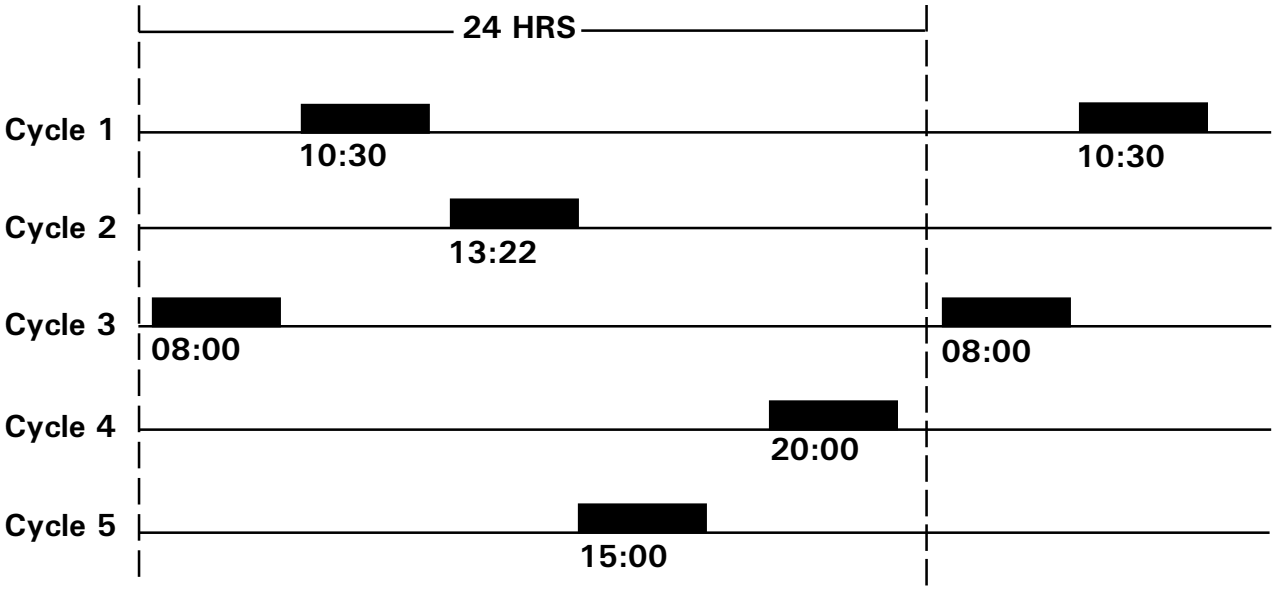
SETTING THE CLOCK

- Set the selection knob to the **CLOCK** position. The current time is displayed. When you first turn the unit on, this value is flashing and continues to flash until both the hours and the minutes have been correctly entered.
- Press the push-button. The hours start flashing.
- Use the adjustment knob to set the hours. If you are using 12-hour time, make sure the PM LED is properly set.
- Press the push-button. The minutes start flashing.
- Use the adjustment knob to set the minutes.
- Press the push-button to save the new time setting. The seconds are reset to zero.

TIMER OPERATION

Twenty-four different cycles or channels can be programmed on the CS-1TM. Each cycle is defined by specifying a Start Time. When the clock reaches the Start Time for a cycle, the timer output is activated for a time equal to the Running Time. Only one Running Time is defined for all the cycles. Each cycle can be enabled or disabled individually. In addition, the Skip-a-day feature allows you to activate the cycles every other day.

Example of Cycle Definitions



NOTES:

(i) If two cycles have identical start times, only one is activated.

(ii) If one cycle is defined to start while another cycle is already activated, the second cycle will start once the first one is completed and will be activated for the entire duration of the Running Time.

AUTOMATIC MODE

DEFINING THE RUNNING TIME
■ Turn the selection knob to **RUNNING TIME**. The current running time is displayed.
■ Press the push-button. The minutes of the running time start flashing.
■ Use the adjustment knob to set the minutes. The maximum value permitted is 99 minutes.
■ Press the push-button. The seconds of the running time start flashing.
■ Use the adjustment knob to set the seconds.
■ Press the push-button to store the new running time.

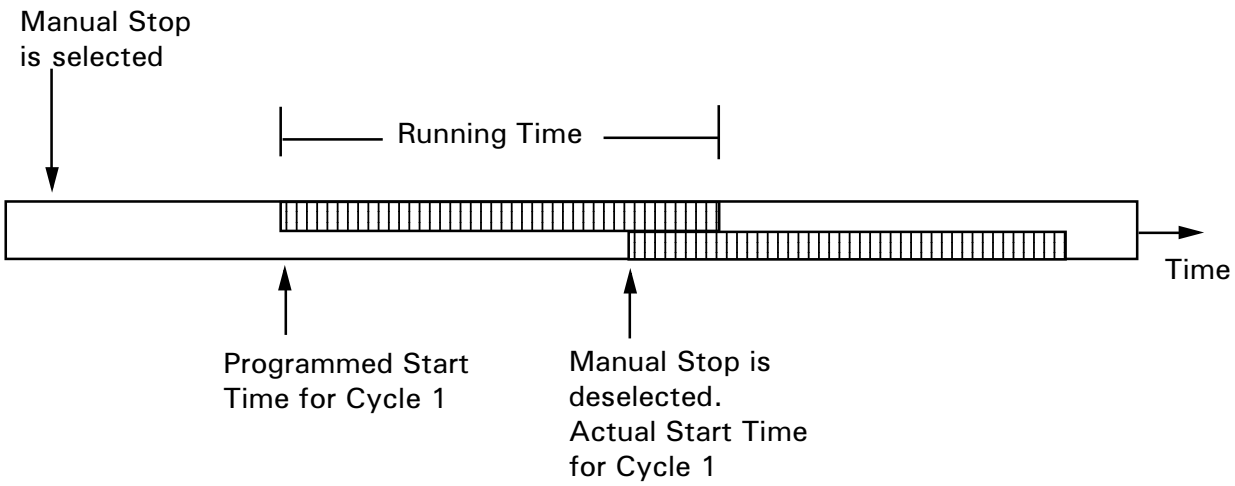
DEFINING THE START TIMES

- Set the selection knob to the **START TIME** position. The display shows "**CH 1**" and the number "1" (representing the cycle number) is flashing.
- Using the adjustment knob, select the cycle (or channel) number.
- Press the push-button once. The current On/Off status of the selected cycle is displayed and flashes.
- Use the adjustment knob to enable or disable the selected cycle. Turn the knob to the right to enable, or to the left to disable.
- Press the push-button once again. The current start time is displayed with the hours flashing.
- Use the adjustment knob to set the hours of the start time.
- Press the push-button. Now the minutes of the start time start flashing.
- Use the adjustment knob to set the minutes of the start time.
- Press the push-button to store the new parameters and select another cycle.

MANUAL MODE

ONE CYCLE START — You can manually activate an output at any time by turning the selection knob to **ONE CYCLE START**. After a 5 second countdown, the output is activated. The display shows **Star** and the output LED turns on. When the running time has elapsed, the output is deactivated, the output LED turns off and the display shows **Stop**. If you leave the selection knob on **ONE CYCLE START**, another cycle will be activated immediately after.

MANUAL STOP — You can manually stop all cycle activity by turning the selection knob to **MANUAL STOP**. After a 5 second countdown, the display shows **Stop**. Any cycle that is currently activated is stopped and no new cycles planned at a later time are activated. To return to automatic mode, turn the selection knob to **CLOCK**. If you return to automatic mode inside a cycle window, and if that cycle was not already activated previous to the manual stop, the cycle will be executed for the entire duration of the running time (this also applies to the Skip-a-day function — see diagram below).



SKIP-A-DAY FUNCTION

This feature allows you to operate the cycles only every other day. You can choose to start skipping immediately or on the following day (at midnight). If you choose to start skipping immediately and a cycle is currently activated, the skipping feature will take effect after the running time of the current cycle has elapsed. If you disable the Skip-a-day function inside a cycle window, the cycle will be activated for the entire duration of the Running Time (see the diagram above where this is applied to the Manual Stop function).

USING THE SKIP-A-DAY FUNCTION

- Turn the selection knob to **SKIP-A-DAY**. The current On/Off status of the Skip-a-day function is displayed.
- Use the adjustment knob to enable or disable the Skip-a-day function. Turn the knob to the right to enable, or to the left to disable.
- If you have enabled the Skip-a-day function, use the push-button to determine when to start skipping. Turn on the SKIPPING LED to start skipping immediately. Turn off the SKIPPING LED to start skipping on the following day.

❼ ALARM CONDITIONS

An alarm is set off when one of the following situations occurs:

(i) the battery is low
(ii) the permanent memory chip is not working properly
(iii) a power failure occurs
(iv) the microprocessor is defective.

❽ BACK-UP BATTERY

A 1/2AA lithium battery is included with the timer. It is used to power the internal clock in the event of a power failure. None of the other timer functions will operate if this happens. When power is restored, the timer will resume activation of the cycles exactly where it left off when the power failed. For example, a cycle that was already activated will be resumed for the remainder of the Running Time.

To continue operating the timer when a power failure occurs, a 12VDC input is included (see wiring diagram for hookup). If you use a rechargeable battery, **NEVER RECHARGE WHEN THE BATTERY IS CONNECTED TO THE UNIT**.

❾ TECHNICAL SPECIFICATIONS

Supply: 115/230 VAC, 50/60 Hz, overload and overvoltage protection fuse F6-1A fast blow.

12 VDC for AC back-up supply; can activate output and alarm if supplied with DC back up voltage.

Output: ON-OFF output, 115/230 VAC, 50/60 Hz, 30 VDC, 6A motor output, 10A RES, fuse F7-10A slow blow.

Alarm: ON-OFF output, 115/230 VAC, 50/60 Hz, 30 VDC, 3A, fuse F5-3A slow blow.

Enclosure: ABS, moisture and dust-tight.

The room temperature where the controller is located MUST ALWAYS REMAIN BETWEEN 32° AND 104°F (0° AND 40°C).

⑩ TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
The display doesn't work.	The circuit breaker at the service panel is off or tripped. The wiring is incorrect. The F6 input fuse is blown. The voltage selector switch is in the wrong position. The display board interconnect cable is unplugged from the power supply board.	Reset the circuit breaker. Correct the wiring. Replace the fuse. Set the switch to the correct position. Plug the cable in firmly.
The timer seems to be working but the equipment is not running.	The wiring is incorrect or loose. The F7 output fuse is blown.	Check the wiring. Replace the fuse.
The Low Battery pilot light turns on.	The battery is low. The battery has been turned OFF.	Unplug the unit. Turn off the battery. Wait 15 seconds then turn the battery on and plug the unit in. Note that the clock time may be lost. If the pilot light is still on, return the unit to your dealer. Unplug the unit. Turn the battery on and plug the unit in. Note that the clock time may be lost. If the LOW BATTERY pilot light turns on when you first turn the unit on, turn power off, turn the battery switch offf. Wait 15 seconds then turn the switch on again and restore power to the unit. Note that the clock time may be lost. If the pilot light is still on, return the unit to your dealer.
The display is steady and shows the letters "EEPR". When this happens, all cycle activity is stopped.	The permanent memory is not functioning properly.	Unplug the unit. Turn off the battery and turn it back on. Plug the unit in. If the problem persists, contact your dealer. Note that this may erase your programming.
The display flashes the letters "EEPR". When this happens, all cycle activity is stopped.	The permanent memory is not functioning properly.	Try resetting the system by holding the push-button down for 5 seconds. Note that this may erase your programming.