

RM Manual

RM

Users Manual

**Models:
7, 11, 15**



Document #50002-7 Rev. B March 2001

Table of Contents

1.0	Introduction.....	4
2.0	RM 7, 11, or 15 Controller Features.....	4
2.1	Function Keys.....	6
2.2	Execute Keys.....	7
2.3	Data Keys.....	7
3.0	Hello Modes and Automatic Default Program.....	8
3.1	Automatic Mode.....	8
3.2	Rain Switch.....	8
3.3	Battery Backup and Power Failures.....	9
4.0	Basic Programming Examples.....	9
4.1	Fundamental Information Required in a Program.....	9
4.2	Set Time.....	9
4.3	Program.....	10
4.3.1	Program Selection.....	10
4.3.2	Program Clear.....	10
4.4	Watering Day Selections.....	11
4.4.1	Water Days.....	11
4.4.2	Skip Days.....	12
4.5	Stations and Watering Lengths.....	12
4.5.1	Stations.....	13
4.6	Start Times and Automatic Program Overlap Protection.....	14
4.6.1	Start Time.....	15
5.0	Manually Activated Functions with Examples.....	16
5.1	Manual Program.....	16
5.2	Manual Station.....	16
5.3	Manual Master Valve/Pump.....	17
5.4	Manual System Check/Syringe Cycle.....	17
6.0	A Simple Example.....	18
7.0	A Complex Example.....	18
7.1	Set Time.....	18
7.2	Program 1.....	19
7.2.1	Watering Day Selections.....	19
7.2.2	Stations.....	20
7.2.3	Start Time.....	20
7.3	Program 2.....	21
7.3.1	Watering Day Selection.....	21
7.3.2	Stations.....	22
7.3.3	Start Time.....	22

7.4	Program 3.....	22
7.4.1	Watering Day Selections.....	23
7.4.2	Stations.....	23
7.4.3	Start Time.....	23
8.0	Controller Placement.....	23
8.1	Mounting the Outdoor Controller	24
8.2	Mounting the Indoor Controller.....	24
9.0	Electrical Connections.....	24
9.1	Electrical Connections for a Pump and Appliances.....	26
10.0	Remote Control Capability	26
11.0	In Case of Difficulties.....	27
11.1	Display is Blank.....	27
11.2	After Power Failure – Can’t Program or Display is Scrambled.	27
11.3	No Station Turn on Automatically.....	27
11.4	A Station Stays on.....	27
	Addendum Instructions for all RMB Series Irrigation Controllers	28

1.0 Introduction

Having purchased a Rain Master Irrigation Systems' controller, you have selected a product of the highest quality, which will bring you years of trouble-free service and enhance the appearance of your landscape through efficient control of water.

Your RMIS controller contains many features which will simplify the control of your irrigation system as well as simplify troubleshooting of your system should a problem arise. Although you may certainly use our controllers just by referring to the Quick Reference sheet on the inside of the controller's door, we suggest you take a few moments to read this manual which details all the capabilities of our units. Should you at any time have a question, feel free to us a call or contact your serviceman.

2.0 RM 7, 11, or 15 Controller Features

1. All solid-state design with accuracy to the second. No moving parts to wear out.
2. Protected 24 keyboard.
3. Multiple displays provide truly simple programming and information recall. The display indicates the active program.
4. Both indoor and weatherproof, watertight outdoor cases available.
5. 9v battery (not included) keeps the program information and time and day during power failures.
6. Automatic Default Program (ADP), in case of power failure and no battery, will water every station 10 minute Per day.
7. Resettable circuit breaker.
8. Master Valve/Pump start circuit which may also be controlled by itself in the Manual mode.
9. Three programs available to the user.
10. Twelve start times – four per program.
11. The watering length for each station may be set from 1 minute to 9 hr. 59 minute In 1minute increments.
12. Manually activated syringe cycle.
13. All stations in a program water in sequence.
14. Water days for each program may be based either on a seven day week or on a skip day routine allowing every 2nd, 3rd, 4th, 5th, 6th, or 7th day watering.
15. Rain Switch (Auto/Off) turns off all stations without disturbing the program.

16. Available with 120v, 50/60Hz or 220.240v, 50Hz wiring.
17. Pedestal available for all outdoor controllers.
18. Manually activated System Check feature will sequentially water all stations for 1 minute 45 sec.
19. Manual program will run any program.
20. Manual station will run a selected station for a selected time.
21. Automatic Program Overlap Protection (APOP) ensures that only one program waters at a time.
22. Remote control capability built into every clock.
23. UL approved.

2.1 Function Keys

PROGRAM

Used to select the program, either 1, 2, 3, or 4.

STATIONS

Used to enter both stations and their associated watering lengths.

**WATER
DAYS**

Used to establish the watering days based on a seven-day week.

**SKIP
DAYS**

Used to establish the number of days between watering, both 1-6 and the first day of the current week to begin watering.

**SET
TIME**

Used for setting the time of day and the day of the week.

MANUAL

Used for manually activating a program, station, the master valve/pump or the system check/syringe feature.

**START
TIMES 1**

Used for establishing start times for a program.

**START
TIMES 2**

Used for establishing start times for a program.

**START
TIMES 3**

Used for establishing start times for a program.

**START
TIMES 4**

Used for establishing start times for a program.

2.2 Execute Keys



Used for entering information after placing it in the display.



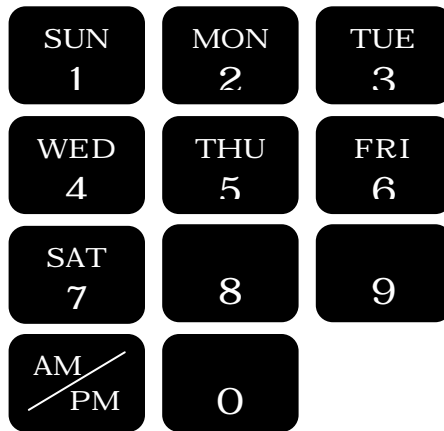
Used for clearing stations, days, etc.



Gets you out of anything and back to the Automatic mode.

2.3 Data Keys

These keys are used to select days of the week when entering time and day.



3.0 Hello Modes and Automatic Default Program


When the controller is first powered up, the display will show HELLO. In the HELLO mode the Automatic Default Program (ADP) will run every station every day for 10 minutes. Should you have a power failure and not have a good battery plugged in which would keep the controller's information and time intact, the ADP program ensures that your landscape will be watered when powered returns.

In the HELLO mode, the ADP will begin the first watering cycle 6 hours after power is reapplied and then continue at 24-hour intervals until the controller is reprogrammed.

Pressing any key will automatically clear the HELLO mode and ADP.

3.1 Automatic Mode

The controller is in the Automatic mode whenever time is displayed and the day of the week indicator is lit.

Pressing  will always return the controller to the Automatic mode.

When a program is watering in the Automatic mode, the program number will be displayed as a convenience.

To stop and cancel a program that is watering.

Press:  

The clock goes back to the Automatic mode.

3.2 Rain Switch

The controller has a rain switch. The switch must be in the AUTO position any time watering is desired. In the AUTO position, watering will occur if the controller is programmed to do so.

The switch should be placed in the OFF position when no watering is desired, such as when it is raining, etc. In the OFF position, no watering will occur because the switch prevents power from going to the valves.

3.3 Battery Backup and Power Failures

The controller uses a 9-volt alkaline battery (not included) to keep your program information and time intact during power failures. When power goes out, the display of the controller will go blank to conserve battery power. When power returns the display will light up and, after one minute, show the correct time and day.

If HELLO appears in the display, the battery is dead and all program information has been lost. The controller will run the ADP, as explained in 3.0, until you reprogram it.

Following return of power, should anything other than HELLO or the time and day appear in the display, remove and discard the battery, press the RESET button for approximately 5 seconds, reprogram the controller and install a new battery.

The battery connector is located in back of the lower front panel of the controller.

Battery Type: 9 volt Alkaline “Transistor” such as Eveready #522.

4.0 Basic Programming Examples

Shown below are examples of how to program the controller as well as how to review and clear information.

4.1 Fundamental Information Required in a Program

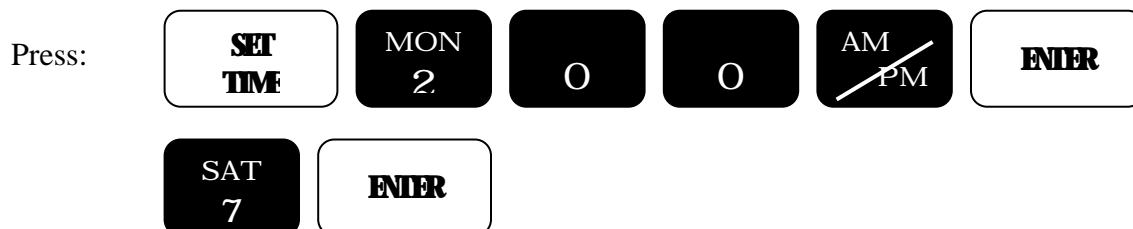
The basic information required in a controller is:

24. The time of day and the day of the week, and within a particular program,
25. The watering days,
26. The station or stations and the watering length for each,
27. The start time or times at which watering will begin on the chosen watering days.

4.2 Set Time

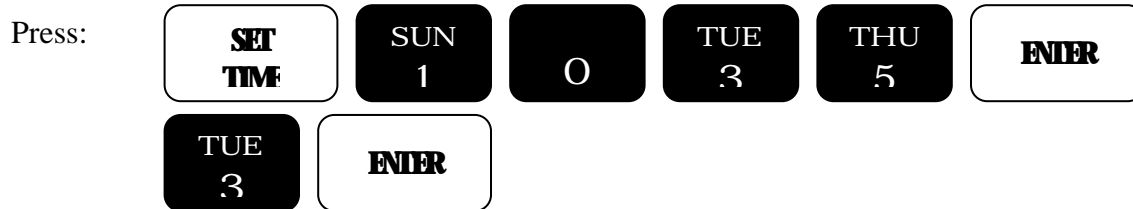
This is used to set the current time of day and the current day of the week.

Example 1: The time is 2:00 PM, Sat.



The clock goes back to the Automatic mode.

Example 2: The time is 10:35 AM, Tues.



The clock goes back to the Automatic mode.

4.3 Program

This is used to select the program you wish to work with. Once selected, you need not change the program # until you wish to program or review information in a different program. There are 3 programs available for your use. They are referred to as 1, 2, and 3.

If desired, it is also possible to both select all information in a program using this function.

4.3.1 Program Selection

This is done to select the program you wish to work with, either 1, 2, or 3. While programming other functions, the selected program number is displayed as a convenience.

Example: You wish to work with Program 2.



The clock goes back to the Automatic mode.

4.3.2 Program Clear

If desired, it is possible to both select and clear all information in a program.

Example: You wish to select and clear all information in Program 1.



The clock goes back to the Automatic mode.

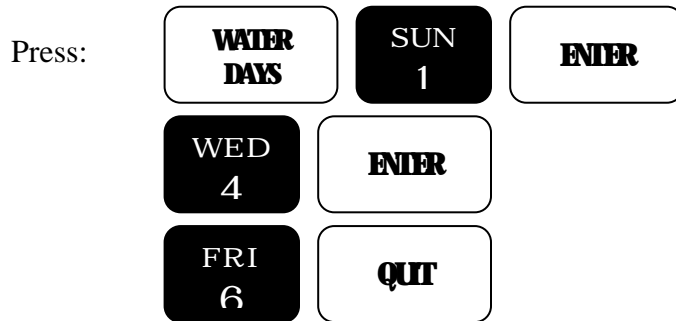
4.4 Watering Day Selections

Watering days for each program may be based on a 7-day week OR a skip days mode. Although you cannot do both within the same program, each of the 3 programs may be set to either mode. For example, Program 1 may be on a 7-day weekly basis but Program 2 might be on a skip day's basis.

4.4.1 Water Days

This is used to select watering days based on a 7-day week. Watering will occur on the days selected each and every week. Selected days are shown in the top display. The program # is shown in the display as a convenience.

Example: You wish to water on Sun., Wed., and Fri.



The clock goes back to the Automatic mode.

To clear a watering day, such as Sun.,



If done



The clock goes back to the Automatic mode.

To review WATER DAYS information,



When done,



The clock goes back to the Automatic mode.

4.4.2 Skip Days

This is used to establish the number of days between watering, either 1, 2, 3, 4, 5, or 6 and the day of the current week on which the first watering will begin. If information has been entered in the past, the skip day number will be shown in the display and the next day watering will be shown in the top display. The program # is shown in the display as a convenience.

Note: By using the skip days mode you can have a program water every 2nd, 3rd, 4th, 5th, 6th or 7th day as may be desired.

Example: You wish to skip 2 days, for every third day watering, and to start it this Wed.

Press:   
 

The clock goes back to the Automatic mode.

To clear all SKIP DAYS information,

Press:   

The clock goes back to the Automatic mode.

To review SKIP DAYS information,

Press: 

When done,

Press: 

The clock goes back to the Automatic mode.

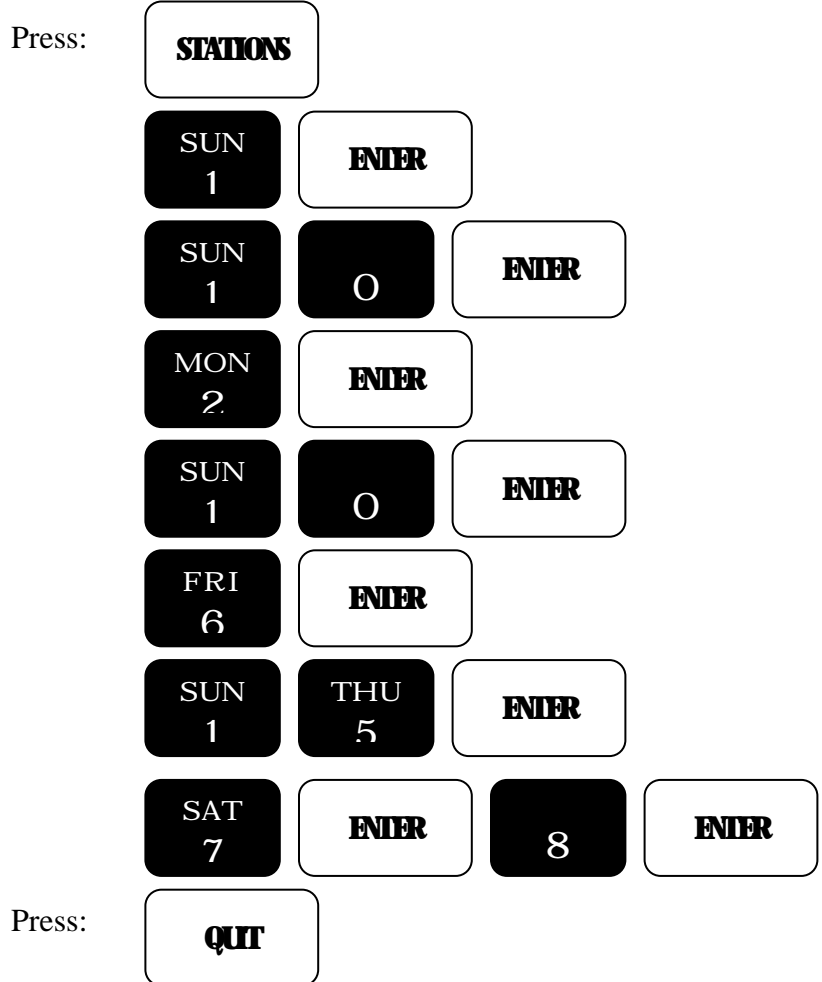
4.5 Stations and Watering Lengths

Any stations may be placed in any program. The same stations may be placed in more than one program at a time if desired. The watering length for each station may be set from 1 minute to 9 hours and 59 minutes

4.5.1 Stations

This is used to select the stations and the length of watering for each station. After entering the station, the watering length for the station is entered. Selected stations are shown in the top display. The program # is shown in the display as a convenience.

Example: You wish to water station 1 for 10 minutes, station 2 for 10 minutes, station 6 for 15 minutes, and station 7 for 8 minutes



The clock goes back to the Automatic mode.

To clear a station and its watering length, such as station 7,



The clock goes back to the Automatic mode.

To review the STATIONS information,

Press: 

When done,

Press: 

The clock goes back to the Automatic mode.

To review the watering length of a station, such as station 6,

Press:   

The watering length is displayed.

Press: 

To clear the station and its watering length or

Press: 

To leave the watering length as is and continue reviewing or if done reviewing,

Press: 

The clock goes back to the Automatic mode.

4.6 Start Times and Automatic Program Overlap Protection

There are four start times available for each of the three programs. They are referred to as START TIME 1 ... START TIME 4.

Additionally, the controller features Automatic Program Overlap Protection (APOP). This ensures that even if start times overlap, only one program will run at a time. Simply stated, any time a program is watering and a start time for a program comes up, the conflicting start time will be delayed until the current program completes its watering.

For example, if program 1 is one hour long due to the stations and watering lengths placed in it, and you set three of its start times to 7:00 AM, the program will water three times – from 7:00 to 8:00, 8:00 to 9:00, and 9:00 to 10:00 thereby providing two repeat cycles.

Another example, if Program 1 was again one hour long and was set to start at 7:00 AM Mon., and Fri. and Program 3 was set to start at 7:30 AM Mon. and Tue. Then on Mon. Program 3 would begin at 8:00 AM, when Program 1 ended, but on Tue. It would begin at 7:30 AM.

APOP assures you that you will always get the number of watering cycles you desire and at the same time your system will never be under pressurized because two programs are running simultaneously.




4.6.1 Start Time

This is used to set the start time for a program. The program # is shown in the display as a convenience.

Example: You wish the program to start watering at 7:10 AM and 4:30 PM.

Press:     

The clock goes back to the Automatic mode.

Press:      

The clock goes back to the Automatic mode.

To review a start time, such as START TIME 2,

Press: 

When done,

Press: 

The clock goes back to the Automatic mode.

To clear a start time, such as a START TIME 2,



The clock goes back to the Automatic mode.

5.0 Manually Activated Functions with Examples

The manual mode makes available four different options shown below:

5.1 Manual Program

This used to run a program.

Example: You wish to run Program 1.



The clock goes to the Automatic mode and shows a 1 in the display to indicate Program 1 is running.

To stop and cancel the watering program,



The clock goes back to the Automatic mode.

5.2 Manual Station

This is used to run a selected station for a selected time.

Example: You wish to water station 6 for 25 minute



The display shows the stations and the watering time. As time elapses, the watering will down count and when there is no time left, the station will shut off and the clock will go back to the Automatic mode.

To stop and cancel the watering station,

Press:  

The clock goes back to the Automatic mode.

5.3 Manual Master Valve/Pump

This is used to run only the MV/P for a selected time. The MV/P is a station 1 higher than the number of stations in the controller. For example on a seven station unit, the MV/P would be referred to as station 8. Use MANUAL STATION to run it.

5.4 Manual System Check/Syringe Cycle

This will water each station, from the first to the last, for 1 minute and 45 sec.

Press:  

Do not press ENTER.

CH will appear in the display indicating check mode. When the last station has watered, the clock will go back to the Automatic mode.

To stop and cancel this cycle,

Press:  

The clock goes back to the Automatic mode.

CAUTION: This mode sequentially runs every station in the controller. For example, you have a 7 station unit but only use 5 stations, it will still apply power to the terminals for station 6 and then to 7 and while doing so will apply to the Master Valve/Pump terminal. This may damage a system using a pump because during the period that stations 6 and 7 are activated, the pump will be pumping against a closed system.

If the system uses a master valve, it will be activated during the period that stations 6 and 7 are active and this could cause heating of the master valve's solenoid if the valve depends on water flow to cool it. So, if all stations are not used, it is strongly recommended that the user cancel the System Check/Syringe cycle after the last used station has watered.

7.2 Program 1

You want to replace information in Program 1 first and it already has information in it, perhaps from the simple example you tried earlier. You wish to clear it out because you are going to place new information in it.






To select and clear the entire contents in Program 1.

Press:   

The clock goes back to the Automatic mode.

7.2.1 Watering Day Selections

Set the watering days for Program 1 to skip 2 days, for every third day watering, and to start it this Wed.

Press:   
 

The clock goes back to the Automatic mode.

7.2.2 Stations

Set the stations and their watering lengths for Program 1 to water station 1 for 10 minutes, station 2 for 10 minutes, station 6 for 15 minutes, and station 7 for 8 minutes

Press:

STATIONS	SUN 1	ENTER
SUN 1	0	ENTER
MON 2	ENTER	
SUN 1	0	ENTER
FRI 6	ENTER	
SUN 1	THU 5	ENTER
SAT 7	ENTER	
8	ENTER	

Press:

QUIT

The clock goes back to the Automatic mode.

7.2.3 Start Time

Set the start time for Program 1 to start at 6:00 AM.

Press:

START TIMES1	FRI 6	0	0	ENTER
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The clock goes back to the Automatic mode.

7.3 Program 2

Select Program 2

Press: **PROGRAM** **MON**
2 **ENTER**

The clock goes back to the Automatic mode.

7.3.1 Watering Day Selection

Set the watering days for Program 2.

Press: **WATER**
DAYS **MON**
2 **ENTER**

TUE
3 **ENTER**

WED
4 **ENTER**

THU
5 **ENTER**

FRI
6 **ENTER**

SAT
7 **ENTER**

Press: **QUIT**

The clock goes back to the Automatic mode.

7.3.2 Stations

Set the watering stations and their watering lengths for Program 2.

Press:

STATIONS	WED 4	ENTER
FRI 6	ENTER	
THU 5	ENTER	
FRI 6	ENTER	

Press:

QUIT

The clock goes back to the Automatic mode.

7.3.3 Start Time

Set the start times for Program 2.

Press:

START TIMS 1	SAT 7	0	0	ENTER
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Press:

START TIMS 2	SUN 1	0	0	AM / PM	ENTER
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The clock goes back to the Automatic mode.

7.4 Program 3

Select program 3.

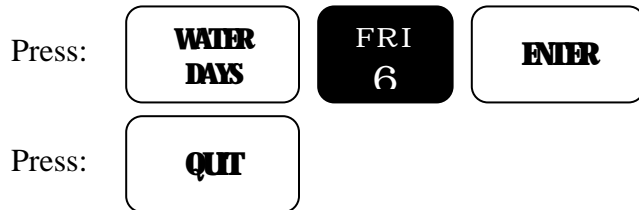
Press:

PROGRAM	TUE 3	ENTER
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The clock goes back to the Automatic mode.

7.4.1 Watering Day Selections

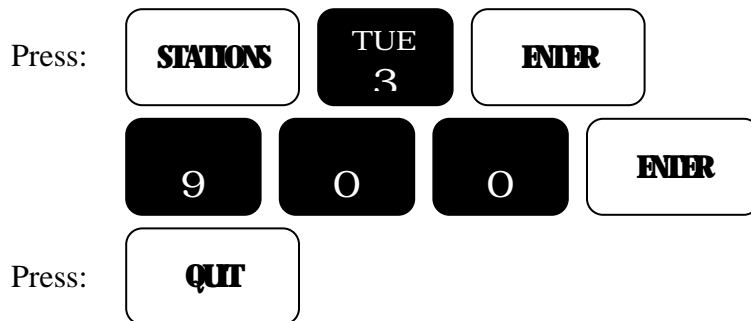
Set the watering days for Program 3.



The clock goes back to the Automatic mode.

7.4.2 Stations

Set the station and its watering length for program 3.



The clock goes back to the Automatic mode.

7.4.3 Start Time

Set the start time for Program 3.



The clock goes back to the Automatic mode.

8.0 Controller Placement

Controllers are available in either an indoor or outdoor enclosure. Both are lockable and dust free, however the outdoor controller is also watertight. Do not place an indoor controller outdoors. Additionally, outdoor controllers should be placed in a shaded and dry environment not subject to direct sprinkler spray or continuous heavy moisture.

8.1 Mounting the Outdoor Controller

On an upright, flat and secure surface, place the mounting bracket at eye level and fasten securely.

Mate the bracket on the back of the controller to the mounted bracket and hang the controller.

Secure the bottom of the controller by placing a screw through the hole located in its back wall at bottom center.

8.2 Mounting the Indoor Controller

On an upright, flat and secure surface place two screws at eye level, 8" apart. Screw the screws into the wall leaving a 1/8" gap between the wall and the head of the screw.

Hang the controller on the two on screws and remove its lower front plate.

Secure the bottom of the controller by placing a screw through the hole located in its back close to the bottom. Note, this hole is located 7 1/16" below the top two and in the center

9.0 Electrical Connections

28. Refer to Figure 1 – Power and Field Wiring.
29. Mount Controller.
30. Place RAIN SWITCH in OFF position.
31. Remove lower panel.
32. Connect ground screw to ground rod or grounded water pipe.
33. Leaving the transformer in place, remove the shipping lock nut.
34. Thread conduit onto transformer.
35. Connect supply line grounded conduit to conduit.
36. Connect 120v, 50/60Hz-supply line to transformer wires within the conduit.
37. Follow all appropriate electrical wiring codes.
38. Install backup battery and lower panel after programming is complete.
39. Place RAIN SWITCH in AUTO position after field valve wiring is complete.

Controller Terminal Strip

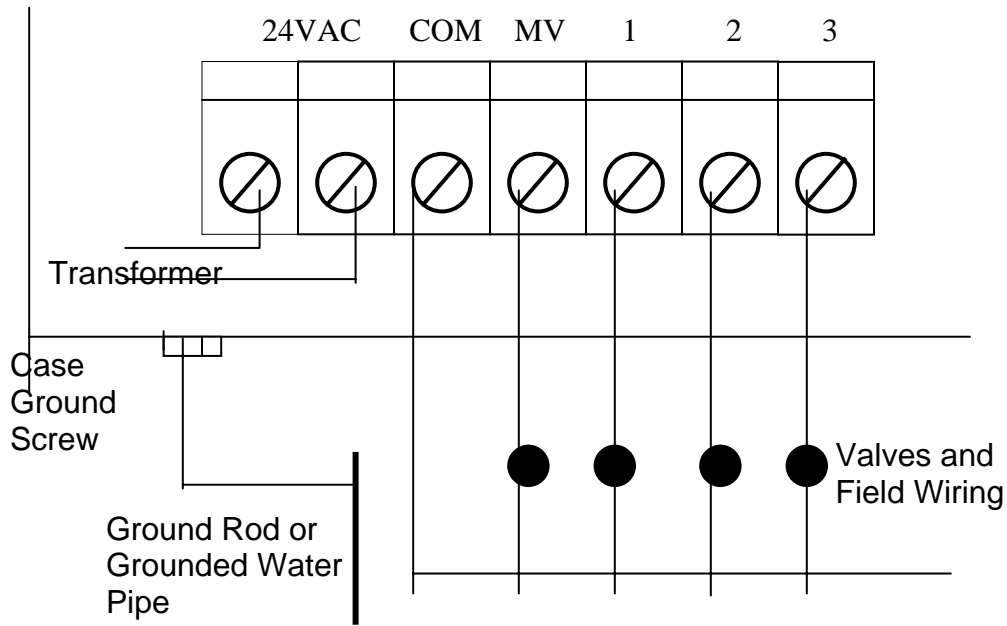


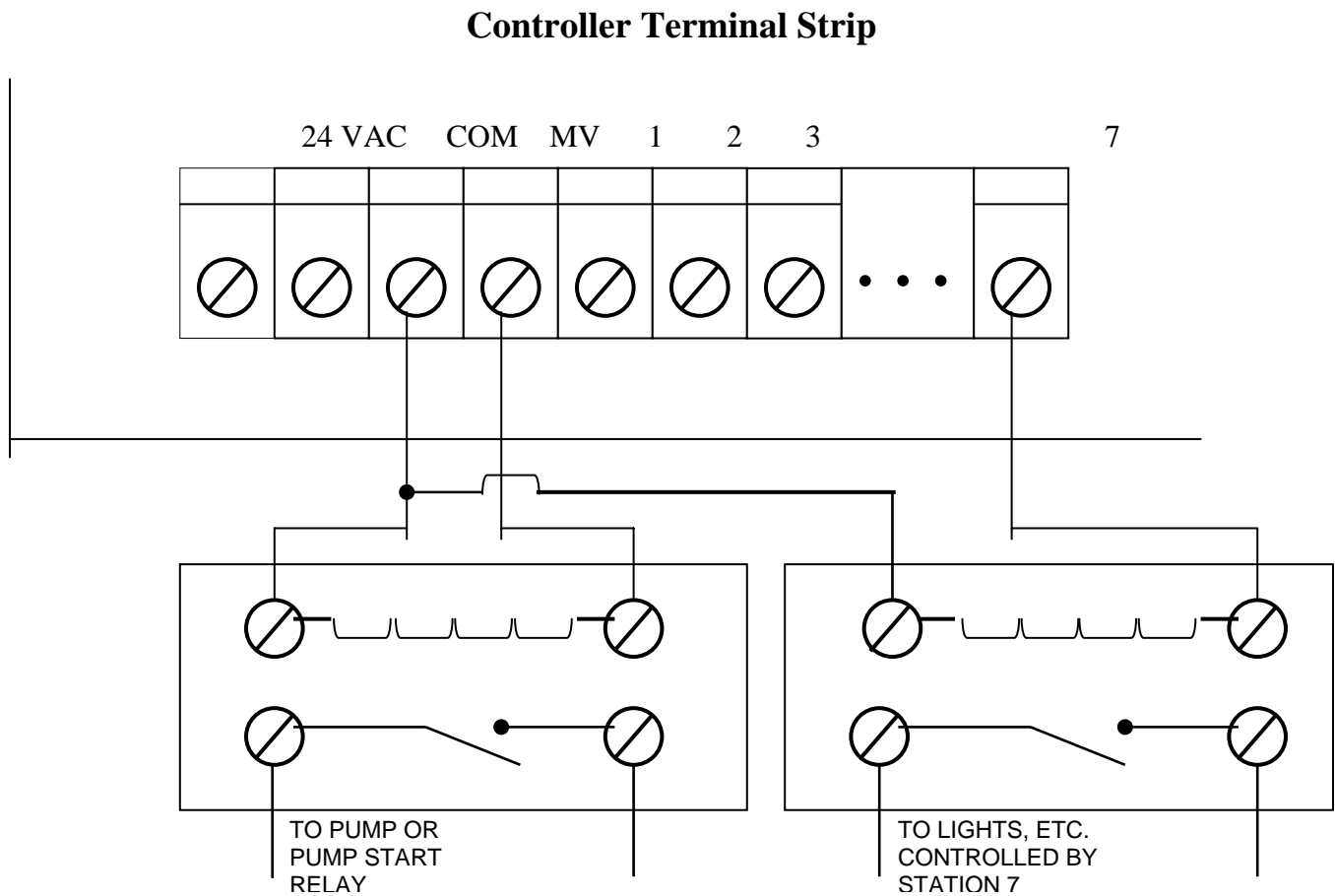
Figure 1. Power and Field Wiring

Warning

40. All electrical connections must be as described above and the box must be properly grounded or warranty is void.
41. Disconnect power prior to making electrical connections or servicing controller.
42. For a complete reset of the controller, remove the backup battery and press RESET momentarily.
43. Never short a station terminal or wire to the common terminal or wire to create sparks for station identification.
44. While a station's terminal is activated do not disconnect the station's wire or the common wire or tap them to the terminal.

9.1 Electrical Connections for a Pump and Appliances

Shown in Figure 2 are the connections for a remote pump start relay as well as how to control miscellaneous appliances such as lighting.



General-purpose relays, with contact ratings appropriate for the load, mounted at least 10" from controller.

Figure 2. Electrical Connections for a Pump and Appliances

10.0 Remote Control Capability

All RMIS controllers feature patent pending, built-in remote control capability, which allows the user to control the clock for a distance of 1 mile non-line-of-sight via a hand-held transmitter. Consult the remote control manual for operating instructions.

Never connect anything other than an RMIS RMRR receiver to the clock's front panel remote control connector for damage will result. Connection of any other remote control system to any portion of an RMIS controller will void all warranties and may cause damage.

11.0 In Case of Difficulties

11.1 Display is Blank

Ensure clock has power.

Remove battery and press RESET for 5 seconds.

Check secondary voltage of transformer for 24v.

11.2 After Power Failure – Can't Program or Display is Scrambled.

Remove and discard battery, press RESET for approximately 5 seconds, reprogram and install new battery.

11.3 No Station Turn on Automatically

Is the controller in automatic mode – press QUIT.

Activate SYSTEM CHECK (section 5.4), if stations turn on, then:

Check for start times,

Check for watering days,

Check for stations and watering lengths.

11.4 A Station Stays on

1. Place RAIN SWITCH in OFF position:

If the station stays on, then:

Check for dirt in valve solenoid causing hung solenoid,

Check for obstruction in valve or possibly a torn diaphragm.

If station goes off, then:

Check station's programmed watering length.

Addendum Instructions for all RMB Series Irrigation Controllers

Document #500027-4 REV. A

This unit functions in the exact same way as our RM series controllers and so you may use the enclosed RM Instruction Booklet for this unit. For convenience, the unit is suitable for outdoor mounting.

Note that the lower row of LED indicators, labeled WATERING STATIONS, is used only to indicate the station watering.

All holes for mounting the unit are provided. Do not drill additional holes in the case. Metal shavings will mix the electronics and damage will result.

To install the controller:

Lay the controller on its back on a flat surface and remove its lower panel. Take the 115/24v transformer and place it in the bottom of the box with its label against the bottom of the controller where the holes are located.

Run the black and white wires through the hole for the transformer located in the bottom of the controller at the right.

Carefully tilt the transformer up such that its threads extend out the hole. Do not let the transformer slide further up into the controller – damage could result.

Thread the ½” C electrical conduit (included) onto the transformer.

Connect each of the two yellow 24v wires to the two left most terminals (labeled 24 VAC) of the terminal strip.

Mount the controller’s hang bracket to the wall at eye level and hang the controller.

Feed the filed valve wiring through 1 ¼” PVC up to the controller and place a 1 ¼” slip by thread PVC electrical conduit fitting on the end of the pipe.

Insert the threaded end of the fitting through the hole in the bottom of the controller and place a lock nut on it.

Secure the PVC pipe to the wall.

See the Electrical Connection Section of the manual and connect the earth ground to the ground screw on the bottom of the controller.

See the Electrical Connection Section of the manual and connect the 117v A.C.

See the Electrical Connection Section of the manual and connect the field valve wires to the terminal strip.