

## INSTALLATION AND OPERATING INSTRUCTIONS

# WATERMARK®

## Multiple Hydrozone Systems — MHS



### ***Automates your Irrigation Controller to Water ONLY when Necessary***

For use with multiple WATERMARK Electronic Modules — WEM

The WATERMARK Multiple Hydrozone System (MHS) allows the use of up to eight Watermark Electronic Modules (WEM) with any irrigation system sharing a common ground, using a 24 Volt AC irrigation controller. A complete moisture sensing automation system consists of any 24 VAC irrigation controller, the Watermark Multiple Hydrozone System connection box, the number of Watermark Electronic Modules required and the appropriate number of Watermark Jumper Cables (one per irrigation valve).

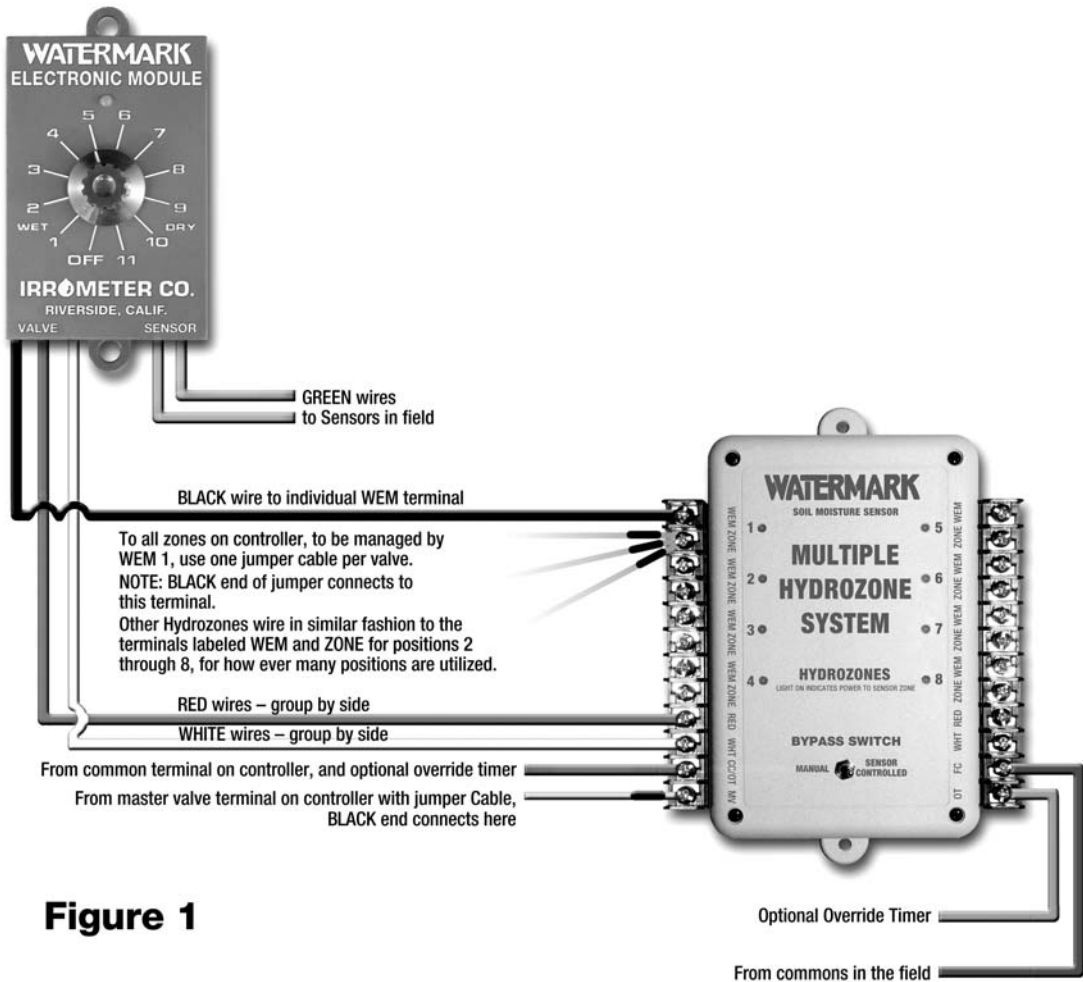
Each WEM establishes a moisture sensing location for a Hydrozone (as many irrigation zones as can be logically grouped together with similar watering needs). The individual WEM's sensor leads will connect to their own pair of Watermark sensors placed in a strategic location in the last zone to run in the irrigated area. The WEM's control leads will connect to the terminal strips on the Watermark Multiple Hydrozone System. All WEM connections (except the sensor wires) for the first four Hydrozones and the controller common are made on the left side terminal strip, and connections for Hydrozones five through eight and the field common are made on the right side terminal strip. Watermark Jumper Cables (JC) are used to connect the irrigation controller's zone terminals to the terminal strips as well. The terminal strips are labeled for all these connections.

Sensor placement is vitally important to effective irrigating.

The groups of valves (Hydrozones) created should have similar water demands, such as full sun turf zones being one Hydrozone and trees on a drip line being a different Hydrozone. The sensor location should always be placed in the last zone to run within that Hydrozone's grouping of valves, since this is the location determining whether irrigation will take place for all zones in that grouping. A sensing location consists of two Watermark sensors wired in series. With shallow rooted plants, like turfgrass, these sensors should be placed several inches apart at the same depth. With deeper rooted plants, like shrubbery, the sensors would be placed at varying depths. In this instance, the moisture reading is an average of the sensors at both depths.

The indicator light on the face of the Watermark Multiple Hydrozone System connection box will light whenever the controller is powering one of the zone valves in that Hydrozone. The indicator light on the face of the WEM for that same Hydrozone will illuminate if it has allowed irrigation to take place (the soil moisture was drier than the set point). If the WEM light is not illuminated when power is going to that Hydrozone, irrigation has not been allowed (because the soil moisture was wetter than the set point). In this instance, you can determine the approximate soil moisture reading at the time that sensor location was read (the start time of that irrigation cycle) by turning the WEM dial down until it illuminates.

The Watermark Multiple Hydrozone System connection box has a bypass switch near the bottom. Placing the switch in the Sensor Controlled position allows the moisture sensing system to override the controller when moisture conditions indicate. Placing the switch in the Manual position will allow the controller to operate independently of the moisture control system. The Manual position should be used for the initial "wetting in" of new plantings (typically from 30 to 60 days for plant establishment) and for manual operation for maintenance purposes. Each WEM also has a bypass position, which operates in the same fashion, but only for the specific Hydrozone for which it has been wired to monitor. There are two terminals on the connection terminal strip for an optional override timer. If a manual timer is attached to these connections, a bypass (Manual) condition for the system can be initiated when the timer is activated. This is beneficial for system maintenance checks so the operator does not need to go back to the controller to place the system back in Automatic (Sensor Controlled) when maintenance is finished. After the timer has "timed out," the system will automatically go back into operation. We recommend the use of an Intermatic model FF60M (for up to 60 minute duration) or model FF2H (for up to 2 hour duration), or equivalent.



**Figure 1**

**Notes** – With pump start systems; care must be used in sequencing the zones to minimize the potential for start/stop decisions by the system. All zones within the same Hydrozone should run in sequence. Run times should be of sufficient duration so as not to exceed the maximum number of starts per hour recommended by the pump motor manufacturer. As irrigation proceeds from one zone to the next in sequence, the MHS will maintain power to the common while the appropriate sensor is being read. If that zone is not being allowed to run, the common will be opened allowing the pump to shut off. It will remain off until a zone is selected which requires irrigation. Pump start relay must share the common with the valves.

If some zones are not controlled with the MHS, they must be the first in sequence on the irrigation controller and have their own common ground. All subsequent zones must be wired to the MHS on another common ground.

### Factory Wired & Mounted Multiple Hydrozone Systems

If you have purchased the MHS in this version, most of the wiring has already been done for you at the factory, along with the mounting of all components on an aluminum back panel for easy installation in your control enclosure. There are only a few connections you will need to make. Attach the Jumper Cables (JC) from the zone valve terminals of your irrigation controller to the appropriate Hydrozone (WEM) position indicated on the

upper terminal strip of the MHS. Be sure and attach the Black end of the JC to the MHS terminal connection. As many jumper cables as necessary for each Hydrozone (WEM) can be twisted together and connected to these terminals. The common from the irrigation controller is connected to the “Controller Common” terminal on the same upper terminal strip on the MHS. Sensor wires from the field are connected to the appropriate Hydrozone (WEM) position on the lower “Sensor” terminal strip on the MHS. The Field Common wire(s) are connected to the bottom terminal strip on the MHS labeled Field Common.

### Individual Component Multiple Hydrozone Systems

If you have purchased the MHS system individual component items, you will need to make the wiring connections to attach the modules (WEM) to the MHS, the irrigation controller and the field wiring. Refer to **Figure 1** for reference.

Each WEM wires to the MHS connector box terminal strips:

- Black wire to the appropriate “WEM” labeled terminal.
- Red wire to the “RED” terminal on either side.
- White wire to the “WHT” terminal on either side.

Each WEM wires to the field sensors:

- Green wires to the appropriate sensors placed in the field.
- Each WEM uses a pair of sensors, wired in series

**Note** – Be sure to use waterproof splices for all buried connections. Use UF wire for buried sensor wiring, AWG 18 for distances up to 1000 ft. or AWG 16 for up to 2000 ft.

- As many Jumper Cables (JC) as necessary, for each Hydrozone, are run from the irrigation controller terminal strip to the appropriate “ZONE” terminal on the MHS. Note: Be sure to connect the Black end of the JC to the MHS terminal. Several jumper cables may be twisted together and connected here, depending on how many irrigation valves are being controlled by each WEM.
- The controller’s common is connected to the MHS terminal labeled “CC/OT.”
- The commons from the field are connected to the MHS terminal labeled “FC.”

The controller’s Master Valve terminal is connected to the MHS terminal labeled “MV.” This connection is only necessary if a master valve or pump is being used.

If an optional override timer is used, it should be wired to the two terminals on the MHS labeled “OT” and “CC/OT.”

**WARRANTY:** The IRRMETER COMPANY warrants its products against defective workmanship or materials under normal use for one year from date of purchase. Defective parts will be replaced at no charge for either labor or parts if returned to the manufacturer during the warranty period. The seller’s or manufacturer’s only obligation shall be to replace the defective part and neither seller nor manufacturer shall be liable for any injury, loss or damage, direct or consequential, arising out of the use of or inability to use the product. This warranty does not protect against abuse, shipping damage, neglect, tampering or vandalism, freezing or other damage whether intentionally or inadvertently caused by the user.

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