

# MC-E SERIES SOLID STATE

## Bidding Specifications

Automatic Controller(s) shall be the MC-E Series with stations (4, 6, 8, 12, 18, 24, 30, 36, 42 or 48) as manufactured under the brand name of Irritrol to be installed or wired in accordance with manufacturer's published instructions and applicable electrical codes.

**Operation:** Controller shall be electronically controlled and have 8 independent watering programs that can run concurrently with each station's watering time independently variable from 1 to 59 seconds, in 1-second increments, or 1 minute to 24 hours in 1-minute increments. Controller shall have watering day options of any-days-of-the-week, Odd or Even date or day intervals from 1 (water every day) up to 60 (water once every two months). Each program shall have up to 8 start times available per water day. Controller shall have a flow sensing feature with the capability of detecting over flow, under flow and unscheduled flow conditions. Controller shall shut off the valve or master valve upstream of the unwanted flow event and shall activate an alarm. Controller shall have the option of a remote alarm utilizing station #2 as a dedicated alarm circuit. Controller shall provide for the connection of a flow sensor as well as an interrupt sensor and a start sensor. Each program shall have a "looping" cycle option that shall allow a start time and an end time for the cycle and a delay between loops.

Controller shall utilize a 2-line, 32-character, backlit, dot matrix display for clarity of programming. Controller shall have a monthly water budget program for automatically adjusting the controller's overall watering time to the user's preset schedule throughout the season. Controller shall have a "password" option to restrict programming access to authorized users. Controller shall be convertible to respond to the Toro® brand Sentinel™ central control system. Controller shall have the option for control of a 2nd master valve. Controller face panel/electronics shall be backward compatible to the previous MC Plus-B controller cabinet for upgrades in the field.

**Construction:** Controller shall be enclosed, rust resistant, locking steel cabinet. Quick disconnect cables to the terminal strip shall be standard on 18 to 48-station models. Optional pedestal mounts shall be available (P-2B: for 4 to 12-station models; P-6B: 18 to 48-station models).

**Electric:** Transformer input shall be 120V ac, 60Hz. Transformer output shall be 24V ac, 2.08 amps. Maximum output per station shall be 24V ac, 1.24 amps. Maximum operating output to valves shall be 24V ac, 1.80 amps (including master valve). Controller shall have optimum 2-stage primary and secondary surge protection.

# CMR-KIT

## Bidding Specifications

Remote control shall be the CMR-KIT as manufactured under the brand name Irritrol and connected and used in compliance with FCC regulations and manufacturer's published instructions.

**Operation:** Remote control transmitter and receiver shall have an operating range up to 1.5 miles line-of-sight (LOS) with a typical urban range up to ½ mile. The system shall remotely operate and be compatible with several series of Irritrol and Toro brand irrigation controllers for maintenance and troubleshooting applications. The station operations available shall be, but not be limited to, turning a controller station on or off, advancing up or down to operate the adjacent station, pausing and resuming a station's operation and starting a 2-minute test run of all stations in sequence. The remote control system shall be available in an all-in-one kit with carrying case in addition to each component available separately. The remote shall be settable up to 999 addresses to prevent interference or "cross talk" with other CMR receivers and shall be settable up to 99 stations. The remote system shall utilize a quick connect/disconnect assembly to allow the receiver to be easily moved from one controller to another.

**Construction:** The remote control transmitter and receiver shall be constructed of a durable polymer and shall be resistant to incidental water mist and spray though not waterproof. The wall/conduit mount connector shall include a cover or cap for weather resistance between uses.

**Electrical and RF:** The VHF remote system shall utilize MURS designated frequencies with the ability to detect and avoid busy channels. A dual rate charger shall be connectable to the transmitter to recharge the four (4) AA size NiMH batteries while still installed. The receiver shall be powered by the controller to which it is connected and shall draw <75mA, AC. The system's modulation shall be FM..

# PC CONTROL

## Bidding Specifications

Automatic Controller(s) shall be the PC Control Series with 12, 24, 36 or 48 available stations (up to four 12-station controllers in one system) as manufactured under the brand name Irritrol to be installed or wired in accordance with electrical codes and applicable electrical codes and manufacturer's published instructions.

**Operation:** Controller(s) shall be programmable through the use of a personal computer with an interactive graphic user interface (GUI) that utilizes digital photos of the irrigation zones in the owner's yard and/or garden and shall provide week-at-a-glance and month-at-a-glance program visibility as well as point-and-click and drag-and-drop methods of placing and adjusting stations with the computer's mouse and cursor. From the computer, system capabilities shall include but shall not be limited to, establishing, storing and transmitting automatic irrigation programs, running real time status checks and commanding manual operations. The system shall provide 2-way, wireless communication between the personal computer in the owner's home and the indoor controller(s) elsewhere on the property. PIN numbers (from 0001 to 9999) shall be selectable for unique system addresses to prevent interference from similar systems or unauthorized access. The current schedule shall be stored in the controller's non-volatile memory, to allow the computer to be used for other purposes, as well as in the PC's program. A remote control device shall be included and required for system communication and shall be connectable to the PC via a USB cord or used, handheld, for manual commands to the controller while on site. The remote's range shall be up to one thousand (1000) feet, line of sight.

Through the personal computer, the control system shall be Internet connectable and shall provide access to program updates and help line(s) and shall provide the capability of sending irrigation schedules over the Internet. Also through the PC, the system's Scheduling Advisor™ shall provide a method for retrieving weather forecast information over the Internet and manually or automatically applying the information to the irrigation schedule of any selected zone(s).

The schedule for each of the controller's stations shall be independent of the others with, per zone, water day options of any-days-of-the-week, Odd or Even date or day interval watering with a range from "1" (every day) to "30" (water every 30 days) in 1-day increments. Any days of the week shall be selectable as non-water days. Each station shall have ten (10) available start times per day, each of which shall be independently adjustable for duration of running time. Each station's timing range shall be from one (1) minute minimum up to 24 hours. A water budget feature shall be available for adjusting the station run times for the entire system by percentages as well as a "Wetter/Drier" slide adjustment per station. In addition to controlling irrigation, the system shall offer the option of two stations per controller for landscape lighting switch control. A designated landscape lighting station shall not respond to a rain sensor, to the Scheduling Advisor™, to Odd/Even date or day interval schedules or to "non-water day" settings.

The PC Control system shall be compatible with a normally-closed rain sensor. In the case of a multiple-controller system, only one sensor is required and shall be connected to the controller designated as number one (#1) in the set up process. Indication of irrigation shutoff via sensor shall be viewable at the PC, at the handheld remote and at the controller. Controller shall have a master valve/pump start circuit assignable to individual stations. Delay between station operations, as selected by the operator, shall be visible on the weekly schedule field.

**Construction:** The system shall consist of a disk with software, the remote control device, its desktop stand and USB cord and indoor controller(s). The remote device and the controller(s) shall be made of durable, impact resistant plastic. Controller(s) shall utilize a plug-in-style transformer.

**Electric:** Transformer input shall be 120 VAC, 60Hz for domestic models and shall have an output of 24 VAC (30VA). The maximum output per station shall be 24 VAC, .4amp. Maximum total output shall be 24 VAC, 1 amp including the master valve. Station load capacity shall be the master valve circuit, one irrigation zone valve and an additional 0.1 amp for an Irritrol SR1 relay for landscape light switching. Controller(s) shall have a diagnostic circuit breaker system that shall sense an electrical short circuit in the valve solenoids or field wires, shut off the "shorted" station, and continue to water operable stations as scheduled.