

Chapter 1

Introduction

Congratulations... You have just acquired the worlds most advanced, trouble free, solid state irrigation controller.

Rain Master is pleased to offer the first irrigation controller with expandable capabilities that can grow your needs become more complex and demanding.

As you become acquainted with the Evolution DX2's total capabilities, you will realize how simple it is to program and operate.

Thank you for choosing Rain Master Irrigation Systems.

About This Manual

This manual is designed to serve as a User Manual, Reference Source, and Maintenance Guide. The procedures are presented in systematic steps to easily complete a specific task. The menus throughout these chapters are identified with a sequential listing that starts out with a pointing finger icon (as shown below). This presentation is intended to quickly indicate the menus in the proper order to arrive at the correct programming display screen.



F1=Main Menu
F2=Program
F3=New Program



Figure 1: Evolution DX2 Pedestal Enclosure

Every attempt has been made to show the appropriate screen display throughout the step-by-step process. In cases where a sub-menu is not shown, refer back to the preceding pointing finger icon. Following the listing from that point will easily direct you to the correct sub-menu.

The Evolution DX2 Controller was designed to accommodate a wide range of features and capabilities with unequalled versatility and performance. At the same time, it remains extremely simple to use.

In addition to being the detailed definitive source for all facets of the controller operation, this manual contains extensive troubleshooting information required to resolve field maintenance issues.

Some features of this manual are highlighted below:

Chapter 2: System Basics introduces you to the irrigation controller's front panel by defining basic key operations.

Chapter 3: Getting Started is designed as a quick reference guide. This chapter allows you to initialize a controller and enter a new program in less than 5 minutes.

Chapter 10: Troubleshooting includes field troubleshooting flow charts as well as detailed alarm warning information. Specific appendices have been provided with emphasis on troubleshooting techniques as they relate to the irrigation controller.

Appendix G: Troubleshooting Basics addresses basic troubleshooting principles including an introduction to volt/ohm meter concepts.

Features and Capabilities

Microprocessor-based control of irrigation systems is no longer a luxury. Today's culture is environmentally sensitive, exact control of precious water resources is a must. Even with low precipitation irrigation, excessive run times mean wasted water. Rain Master believes in minimizing waste by maximizing water application efficiency.

The Evolution DX2 is designed to provide precise control of irrigation delivery systems. The water savings realized from these control efficiencies will help ensure an adequate supply of clean water for personal needs, as well as for landscapes, which are so important to the quality of our lives.

Evolution DX2 Features and Specifications

Hardware Features

- Configuration options 6, 12, 18, 24, 30, 36, 42 or 48 stations. Dedicated outputs for 2 Normally Closed Master Valves, 1 normally Open Master Valve, 1 Pump, and auxiliary 24 VAC.
- Connectivity for 4 input sensing devices. 4 pulse input type devices e.g. flow sensors, flow meters, ET device, rain gauge, and anemometer.
- 80 character Liquid Crystal Display (LCD) with 24-key membrane keypad.
- Built-in remote control jack. Adaptor for permanent remote internal mount available.
- Built-in transient protection.
- Optional lightning protection available.

- Audible tone(s) for valid or invalid operator entry.
- Lifetime retention of the user's program and date/time, without the use of batteries.
- All outputs are protected from field wiring short circuits.
- Built in amperage meter to accurately measure and diagnose valve solenoid electrical problems.
- Modular architecture. Modular output boards (6 or 12 station) facilitate maintenance and eliminates total controller down time.
- Available in painted or stainless steel wall mount cabinet or pedestal enclosure.

Scheduling Capabilities

- Operation of 12 conventional programs with 8 start times, 48 ISC (individual station control) or a combination of each
- Watering based upon 14-day schedules, skip day schedules, or 31-day schedules
- Continuous cycling of programs based upon user established start and end times, with a programmable delay/soak time
- Water budget per program from 0 to 999% in 1% increments for adjustment of program run times
- Program by time

- Programmable monthly total water usage, program terminates upon over budget irrigation
- Quick station programming allows groups of stations to be programmed with the same runtime
- Programmable water window

Program Setup Options

- Program overlap protection or concurrent operation
- Irrigation programs, lighting programs, security, etc. (Non-irrigation programs are independent of rain shutdown mode)
- Inter-station delay from 0 to 255 seconds
- Runtimes from 1 second to 24 hours programmable in hours/minutes or minutes/seconds
- Master valve selections: 2 Normally Closed Valves or Normally Open Valves, with programmable delay from 0 to 600 seconds

Maintenance and Alarm Diagnostic Capabilities

- Flow monitoring. Automatic alarm processing (which provides station and/or master valve shut down and program advance as required) diagnosing and reporting station underflow and overflow, mainline breaks, and unscheduled flow. Maximum Upper Flow Limit is 2000 GPM.

- Electrical field wire monitoring. Automatic alarm processing (which provides station shutdown and program advance) for station over current, short circuits, broken field wiring or faulty solenoids.
- Power monitoring. Automatic alarm processing/ reporting for power outages and power restoration. Intelligent program resumption for all outages or power glitches, no lost cycles or water window violations.
- Communication monitoring. Automatic alarm generation/ reporting for lost communications or restoration when using hardwire communications. Automatic fault isolation of communication wiring problems to wire path between controllers.
- Diagnostic lights (LEDs) for all station outputs as well as the dedicated outputs:
 - MV1(Master Valve #1)
 - MV2 (Master Valve #2)
 - N.O (Normally Open Master Valve)
 - PUMP

Lights indicate when 24 VAC is at output terminal.

- Built-in Test (BIT) functions allow selected controller circuitry to be field-tested.
- Manual test mode. Allows user to automatically advance from station to station using manual run time while displaying valve solenoid electrical current for each station as well as station flow in GPM.
- Manual station and Manual multi-station modes. Turns

on any station for user entered runtime and automatically selects usage of the proper Master Valve and/or Pump for this station. Valve solenoid electrical current is displayed. Multi-station mode allows any single station or output to be turned on individually or in combination with any other station(s). Valve solenoid electrical current is displayed.

- Manually entered program. Allows user to enter a one-time program to be run immediately or scheduled for later in the day. The manual program is independent of automatic programs and will start only one time.
- Manual start of automatic programs (1-12). Start any program independent of the scheduled start time and water day.

Miscellaneous Features

- English/Spanish language selection.
- Automatic limit setup (learn mode) for flow and current. Global percentages adjust for limit establishment.
- Omit by date allows the user to enter up to 15 dates to exclude irrigation.
- Operates as a stand-alone or under Central Computer System.
- Fertilizer injector station with programmable delay from 0 to 255 seconds.

- **Flow Max.** This exclusive feature allows controllers with a single point of connection to share a pump, master valves, and flow meters without the need for peripheral wiring/relays. All flow limits are dynamically managed as stations across controller's transition off and on. Features include:
 - Automatic protection and report for main line breaks, unscheduled flow, station high and low flow
 - Read flow at any controller
 - Dynamic monitor shows system status at all times
 - Pump protection during exception conditions

Electrical Specifications

- **Input Power Required:** 117 VAC +/- 15%, 60 HZ, 20 VA, plus load current.
- **Maximum load current per station or master valve output:** 1 AMP.
- **Maximum combined load current:** 2 AMPS.
- **No batteries required.**