Chapter 2
System Basics

The Evolution DX2 Controller contains a comprehensive feature set to support virtually any conceivable irrigation system/configuration. In addition to the more traditional irrigation features, the controller supports multiple sensor inputs, central communications control, extensive fault diagnostics and specialized electronics to insure that product reliability is not compromised. Through use of selected "setup" options, the controller can be adapted to a specific irrigation application.

Although the controller provides numerous features and options, the user interface remains extremely simple. Consequently the operation of the controller remains "user friendly."

**Chapter 2:
System Basics**

Evolution DX2 Controller Front Panel

The Evolution DX2 Controller Touch Key Front Panel provides
all the necessary functions and control to operate and program
the Evolution DX2 Controller.
Figure 2-1: Evolution DX2 Controller Front Panel identifies the
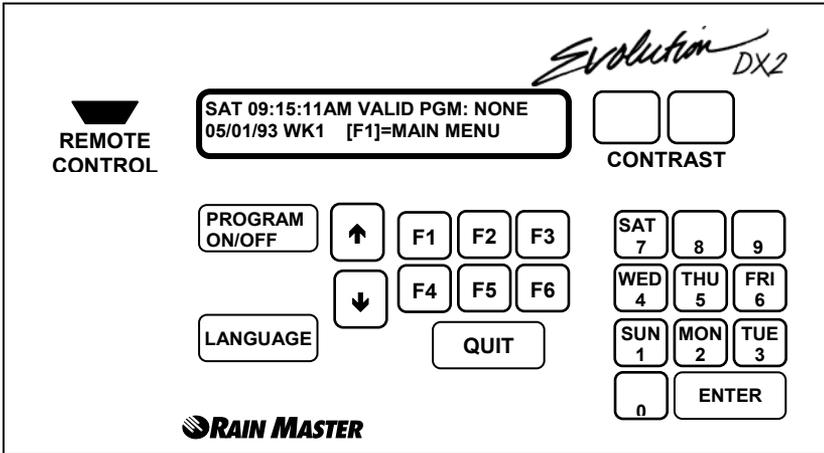location of all touch keys and features.

Figure 2: Evolution DX2 Controller Face Panel

The Evolution DX2 Controller Front Panel provides the
following features:

- The display contains 2 lines, each line capable of
  displaying 40 characters.

- Combination Day/Numeric Key Pad.

- Enter Key - Executes all keypad entries.

- Six Function keys used to select all program menus.

- Full Range Display Contrast Control.

- Program On/Off - Executes or stops any program.

- Ability to select English or Spanish language.

- Up/Down Arrow Keys allow advancement through menus.

- Immediate return to the base screen, using the Quit key.

- Distinctive beep validates each key entry (Touch Tone).

- Built-in Remote Control Connector.

The display screen changes accordingly to the activity being performed.

Base Screen

After controller initialization (see Chapter 3), the base screen, depicted in Figure 2-2, is displayed.

```
SAT 09:15:11AM VALID PGM: NONE
06/18/96 WK1   | F1 | =MAIN MENU
```

Figure 3: Base Screen

- To alter the contrast of the display, use the Contrast keys.

- The base screen displays the day, time, date and additional information, depending upon how the controller is configured.

- The VALID PGM: section of the screen alternates every seven seconds, displaying either the program number(s) or the satellite address. All existing programs will be listed.

  Dashed program numbers such as (2 -5) indicate a range of programs which includes all numbers within the range.

  Numbers separated by commas such as (2, 4, and 6) indicate individual program numbers.

- When the Evolution DX2 controller displays the base screen information, the controller functions in the "automatic mode," meaning that any valid program(s) will automatically start at established program start time(s).

- The manual function (see Chapter 8) disables the automatic mode. The controller has a built in time-out function (2 hour time-out) which returns the controller to the base screen (automatic mode) if the user inadvertently leaves the controller in some other screen.

- User prompts for valid keystroke entry are designated by │ │ (vertical bars) with the key name appearing between the bars.

- The entry │ F1 │ =MAIN MENU prompts the user to press the F1 key to access the Main Menu.

- From the base screen, pressing F1 will display the main menu.

Main Menu

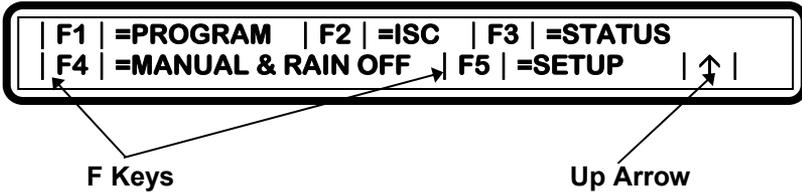The main menu indicates five of the function keys used to access different functions.

```
| F1 | =PROGRAM   | F2 | =ISC   | F3 | =STATUS
| F4 | =MANUAL & RAIN OFF  | F5 | =SETUP    | ↑ |
```

        F Keys   **Up Arrow**

Figure 4: Main Menu

> *Note:*   **The F1 key, which was previously used to select the main menu, is now used to select the Program option. The use of the function keys changes depending upon the contents of the screen display.**

| ↑ | This symbol in the main menu indicates you press the up arrow key on the controller to return to the previous display.

        In this case, the previous display is the base screen. The previous screen would change depending upon which menu options (function keys) you had previously chosen.

Using the Controller Keys

Throughout this manual, the following symbols are used to represent the controller keys you use to move through the menu options and to view or change the settings of your Evolution DX2 controller.

|	
F1 **F2**	Press the associated function key (F1 to F6) to select the option shown on the display screen.
⬆	Press the up arrow key to move to the previous screen.
⬇	Press the down arrow key to move to the next screen.
8 9 5 6 1 2 3 0 **ENTER**	Use the numeric keypad section to enter numbers.
SAT **WED** **THU** **FRI** **SUN** **MON** **TUE**	Use the keypad section to enter days of the week.
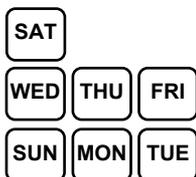
Function Keys (continued):

DARK **LIGHT**
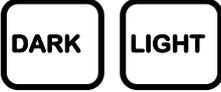
Press the DARK key to increase display contrast and the LIGHT key to decrease display contrast.

Note: Maximum LIGHT setting will appear as a blank display.

ENTER

The ENTER key is used to complete entry of a number or day of the week. For example, to ENTER the number 1, press the 1 key and then press the ENTER key.

QUIT

Press the QUIT key to immediately go to the base screen. The QUIT key bypasses any previous screens and displays the base screen.

LANGUAGE

Press LANGUAGE to change from English to Espanol or from Espanol to English.

PROGRAM ON/OFF

Press the PROGRAM ON/OFF key to immediately turn a program on or off.

"Beep" Responses

To provide user feedback for keyboard entry, two different beeps or tones are omitted. A single beep indicates a valid or correct entry. Rapid successive beeps indicate an invalid entry. For example, from the base screen, select │ F1 │ and a single beep is heard. This indicates │ F1 │ is a valid selection. However, from the base screen select the down arrow and multiple beeps are heard.

System Configuration

The DX2 Evolution Controller is housed in an all weather enclosure containing the following assemblies:

- Keyboard Main Panel Assembly

- Main Power Switch Box Assembly

- Master Valve/Pump/Power Board Assembly

- Station Output Board Assembly
  (Quantity varies depending on station configuration)

- Communication Board Assembly (Optional)

- Sensor Terminal Board Assembly (Optional)

Keyboard Main Panel

The Keyboard Main Panel assembly consists of a main microprocessor control board and an optional sensor control board, which would attached to the main board. Four cables from this assembly provide the connections to the additional internal assemblies which include the Master Valve/Pump/Power board, the Communications board (optional), the Sensor Terminal (optional), and the Station Output board(s).

Main Power Switch Box

The Main Power Switch Box assembly contains the controller main power switch, a dual ground fault interrupter receptacle and a step-down transformer delivering 12 VAC and 24 VAC.

The ground fault interrupter (GFI) provides an exclusive safety feature against electrical power hazards. The GFI can sense and detect any degree of power line shorts and will immediately shut down the power preventing electrical damage or injury. The GFI includes a Test switch and a Reset switch. When the Test switch is pressed, all power will shut down indicating proper operation of the internal control circuitry. Pressing the Reset switch will restore power operation. The diagram of Figure 2-5: identifies the Main Power Switch Box and associated wiring.

Master Valve/Pump/Power Board

The Master Valve/Pump/Power board provides the four outputs for Master Valve 1, Master Valve 2, Normally Open Valve and Pump. Additionally, the assembly distributes the 12 VAC and 24 VAC through their respective fuses to the associated controller assemblies. Figure 2-6: illustrates typical connections for Master Valve and Station connections.

Station Output Board

The Station Output board delivers the 24 VAC required operating valve solenoids, lighting systems, security systems, etc. A Station Output board may be configured with six stations or 12 stations. The controller enclosure will accept a maximum of four output boards providing control for a total of up to 48 stations.

Each board is equipped with two common terminals used for circuit ground return. All common terminals of a multiple station configuration are essentially identical and may be interchanged among the boards for wiring convenience.

Communication Board (optional)

The Communication Board provides the means for communication among controllers and/or the Central Computer. The available communication options are Hardwire, Radio or Phone, communication provides the capability for any number of configurations.

Sensor Terminal Board (optional)

The Sensor Terminal board provides the direct link between the flow sensors, and/or weather station devices and the controller.

The flow and weather sensing option provides four sets of terminal connections; two inputs for flow sensors (or one flow and one ET), one input for a rain sensor and one input for a wind sensor. All inputs are dedicated and calibrated to their respective weather devices.

DX2 Pedestal Controller Assembly Layout

The assembly layout location within the controller enclosure is depicted in Figure 2-4.

1 - Keyboard Main Panel

2 - Main Power Switch Box

3 - MV/Pump/Power Bd.

4 - Station Output Bd.

5 - Communications Bd.

6 - Sensor Terminal Bd.

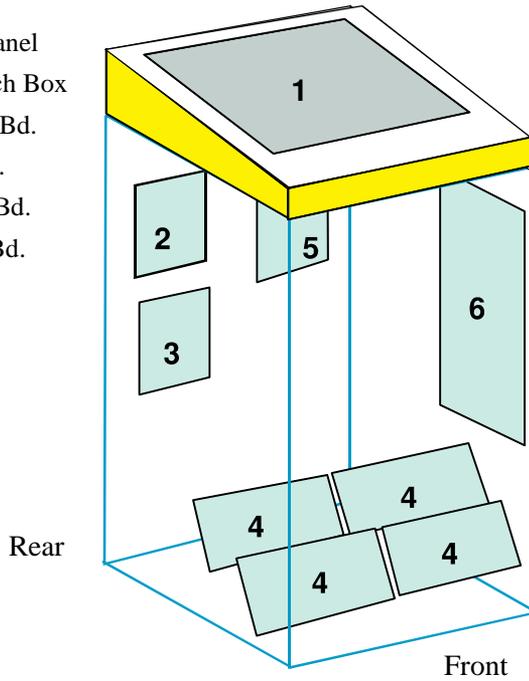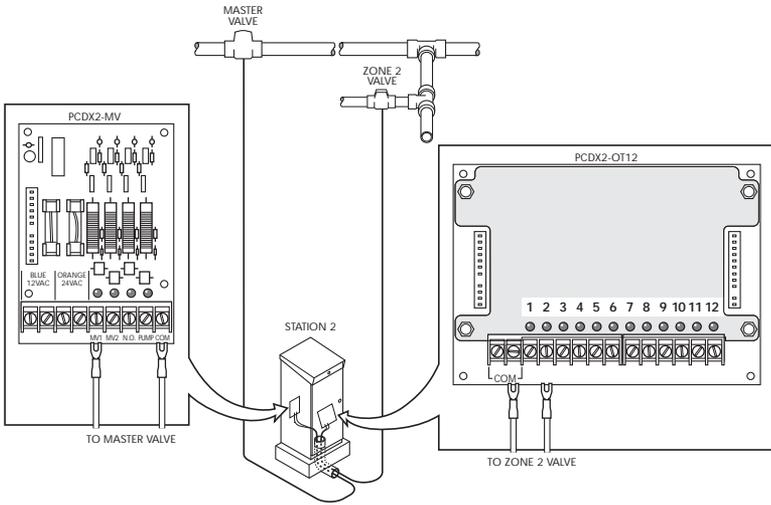**Figure 5: Pedestal Controller Assembly Layout**

Figure 6: AC Power Supply Wiring Diagram

DWG DXMV10A

Figure 7: Master Valve and Station Connection