RAIN BIRD.

ET Manager Cartridge for ESP-LX Modular

Installation & User Guide

ETM-LXM

ET MANAGER™ CARTRIDGE

FIND A LOCAL
WEATHER SIGNAL AT
WWW.RAINBIRD.COM/WRSP

RESET

ESP-LXM

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Safety Information

WARNING:

A CIRCUIT BREAKER OR CUTOFF SWITCH IS TO BE PROVIDED IN THE FIXED WIRING TO ISOLATE THE CONTROLLER. MEMORY IS RETAINED BY A LONG-LIFE LITHIUM BATTERY, WHICH MUST BE DISPOSED OF IN ACCORDANCE WITH LOCAL REGULATIONS.

Lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of un-insulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electronic shock to persons.

Exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

Contents

ET Manager Cartridge Menu Tree

Home Screen (moisture levels)

- Adj → Adjust Moisture Levels
- Alrt → Alert Messages
- EZ → EZ Setup Wizard
- Menu → ET Cartridge Menu

EZ Setup Wizard (left column)
- EZ Setup Wizard
  - Next → Signal Provider Code
  - Next → Weather Region
  - Next → Units
  - Next → Elevation
  - Next → Set Historical ET
  - Next → Irrigation Amount

ET Cartridge Menu

1 → Status
- 1 → Moisture Levels
- 2 → Weather Signal
  - More → Counters
  - More → Paging History
- 3 → ET & Rain

2 → Logs
- 1 → Irrigation Logs
- 2 → Interrupts
- 3 → Weather Information

3 → Settings
- 1 → Irrigation Control
  - Irrigation Amount
  - 2 → Landscape Adjust %
  - 3 → Run Time Limits
- 2 → System Settings
  - 1 → Data Source
    - Weather Region
    - 2 → Rain Source
    - 3 → Signal Provider Code
  - 2 → Control Settings
    - 1 → Effective Rain
      - Next → Max Hourly Rain
      - Next → Saturation Allowance
    - 2 → ET Settings
      - 1 → ET Source
      - 2 → Elevation
      - 3 → Wind Adjustment
    - 3 → Options
      - 1 → Units
      - 2 → Signal Kc
      - 3 → Clear Data
  - 3 → Set Historical ET
- 3 → Weather Interrupts
  - 1 → Rain Cancel
  - 2 → Temp Cancel
  - 3 → Wind Cancel

ET Manager Cartridge for ESP-LX Modular   V

Introduction

Welcome To Rain Bird

Thank you for purchasing your new state-of-the-art Rain Bird ET Manager Cartridge for the ESP-LX Modular Controller. For more than six decades, Rain Bird has led the irrigation industry in meeting all of your water management needs by providing the highest quality products and services available.

ET Manager Cartridge

The ET Manager Cartridge brings evaporation & rain based control to the ESP-LX Modular Controller. The ET Manager Cartridge uses real time weather information to automatically adjust watering run times to meet the needs of the landscape. The ET Manager Cartridge may be used on both indoor and outdoor applications. Key features which the ET Manager Cartridge introduces to the ESP-LX Modular Controller include:

- Seasonal Adjust percentage automatically adjusted according to current weather information to replace water lost through evaporation.

- Weather interrupts based on Temperature, Wind, and Rain to cancel watering in case of inclement weather.

- Displays real-time weather information

- Logs including Interrupt history, Weather Information and Irrigation events showing amount of water applied and number of days watered.

The ET Manager Cartridge is programmed to receive hourly weather information from a local Weather Reach Signal Provider (WRSP) and uses this information along with site-specific settings to determine when and how much water your landscape needs.

The ET Manager Cartridge manages watering by making adjustments to the Seasonal Adjust percentage. When weather parameters are such that watering is not needed, the Seasonal Adjust percentage will be set to 0percentage. When watering is needed, the Seasonal Adjust percentage will vary depending on watering needs and user-defined settings which limit the lowest and highest Seasonal Adjust percentage you want to allow.

Weather parameters used to measure evaporation (ET) include:

- Solar Radiation
- Temperature
- Wind
- Humidity

Rainfall is also measured and may be received either from the weather signal or an on-site rain gauge (the ET Manager Cartridge accepts input from both 1mm/tip and 0.01"/tip rain gauges).

The Tipping Bucket Rain Gauge (ETM-RG) is the recommended on-site rain gauge for use with the ET Manager Cartridge.

To find your local Weather Reach Signal Provider, please check the listing in the ET Manager Scheduler software found on the ET Manager Cartridge Resource CD (included) or visit www.rainbird.com/wrsp.
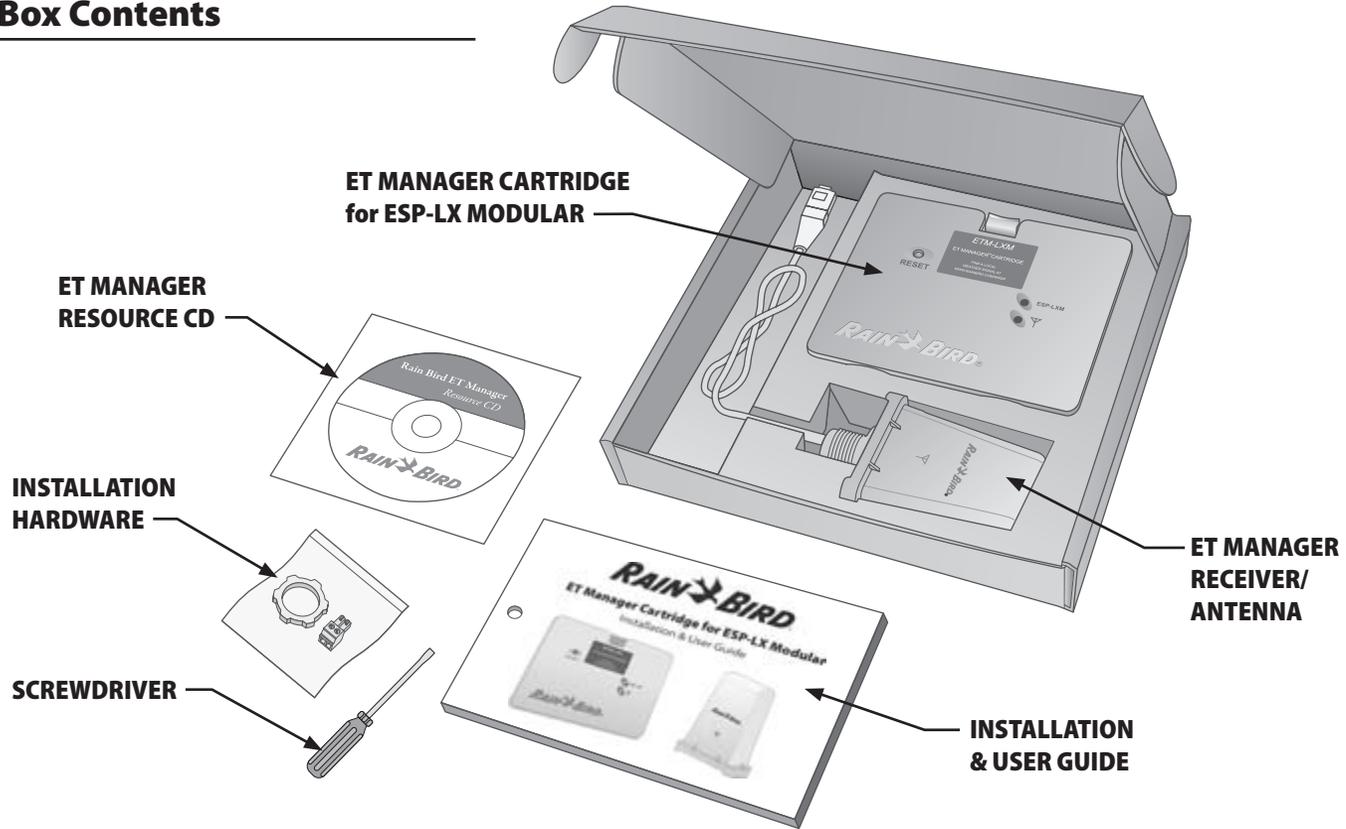
About This Manual

This manual is an addendum to the ESP-LX Modular Controller Programming & Operation Guide. The instructions in this manual guide you through installing an ET Manager Cartridge, mounting the ET Manager Receiver , connecting the ET Manager Receiver Cable, and programming the device to receive weather data and manage watering schedules.

Products Covered In This Manual

This manual describes installation and operation procedures for the following Rain Bird products:

- ET Manager Cartridge for ESP-LX Modular
- ET Manager Receiver Antenna (237506-02)

Box Contents

ET MANAGER CARTRIDGE
for ESP-LX MODULAR

ET MANAGER
RESOURCE CD

Rain Bird ET Manager
Resource CD

RAIN BIRD

INSTALLATION
HARDWARE

SCREWDRIVER

RAIN BIRD
ET Manager Cartridge for ESP-LX Modular
Installation & User Guide

ET MANAGER
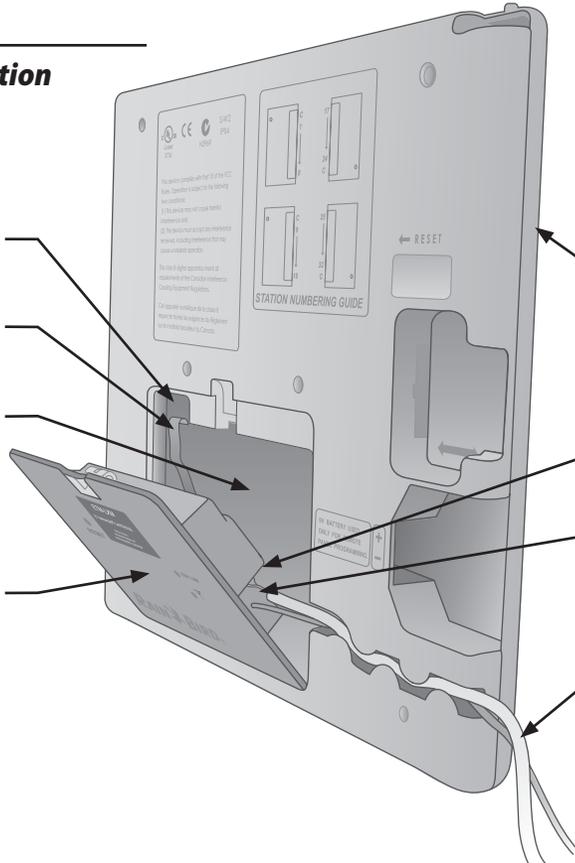RECEIVER/
ANTENNA

INSTALLATION
& USER GUIDE

Installation

ET Manager Cartridge Installation

ESP-LX MODULAR CONTROLLER
ETM-LXM KNIFE EDGE CONNECTOR

RIBBON CABLE

COMMUNICATION CARTRIDGE BAY

ET MANAGER CARTRIDGE

ESP-LX MODULAR
CONTROLLER FRONT
PANEL

TIPPING RAIN GAUGE PORT

ET MANAGER RECEIVER/
ANTENNA CABLE PORT

ET MANAGER RECEIVER/
ANTENNA AND RAIN
GAUGE WIRE

Installing the Hardware

Tools needed: Flat-blade screwdriver (included)

Refer to the ESP-LX Modular Controller Programming and Operation Guide for controller installation instructions. To Install the ET Manager Cartridge, follow the steps outlined below:

❶ Unlock and open the outer door of the ESP-LX Modular Controller.

**❷** Swing open the controller front panel.

⚠ **NOTE:** The ESP-LX Modular Controller is designed to allow safe installation of the ET Manager Cartridge and ET Manager Receiver/Antenna with the power on.
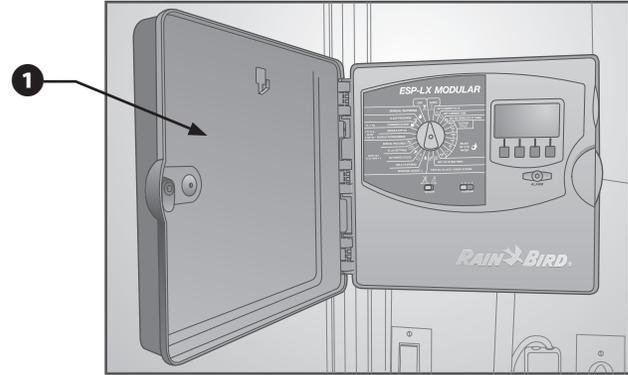
Mount ET Manager Receiver /Antenna

1 Using a screwdriver or other pointed tool, carefully punch through and remove the ET Manager Receiver/Antenna knock-out located on the top of the controller case.

2 Make sure the black washer (included) is in place at the base of the ET Manager Receiver/Antenna. Thread the ET Manager Receiver/Antenna Cable through the knock out and press the ET Manager Receiver base into the hole.

3 Slide the nut (included) up the ET Manager Receiver/Antenna Cable and hand tighten 1/2 turn. The nut should be positioned so the curve is toward the top of the controller case
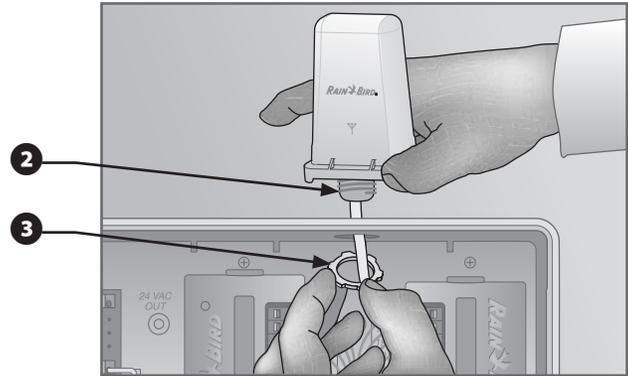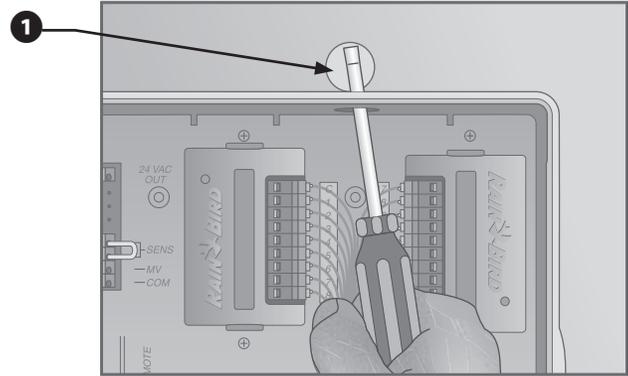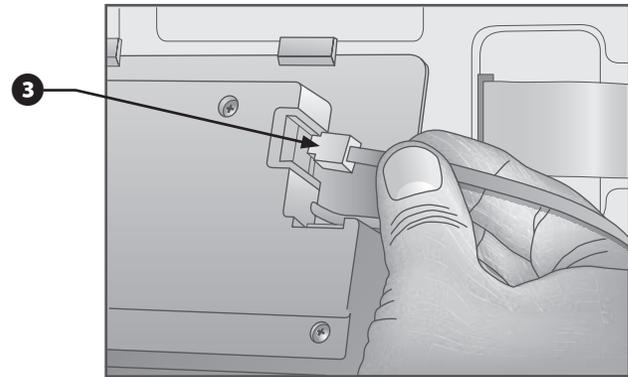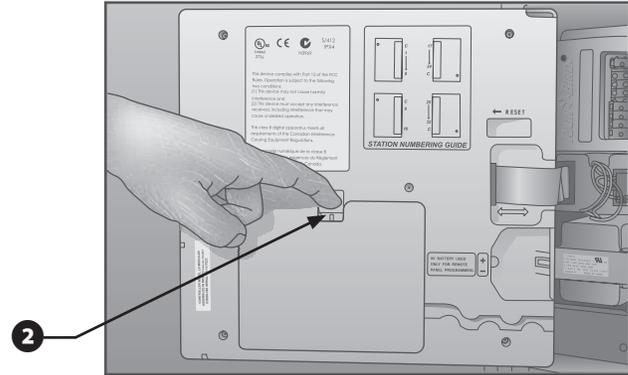
Install the ET Manager Cartridge

1 Prior to beginning the installation process, please turn the dial on the front of the LX Modular controller to Communication

2 Remove the access plate from the back of the front panel, exposing the cartridge bay.

3 Plug the ET Manager Receiver/Antenna Cable's RJ45 connector (male) into the jack (female) in the back of the ET Manager Cartridge.

⚡ **CAUTION!** This connector can only go in one way. Ensure that the ridges on the plug match the slots in the receptacle.

4 Using the supplied screwdriver, connect the end of the ET Manager Cartridge ground wire (green/yellow) to the Ground Spade located on the terminals labeled GND above the transformer.

5 Insert the ET Manager Cartridge in the cartridge bay, bottom edge first.

6 Connect the cartridge ribbon cable to the gold knife-edge connector located at the top-left of the cartridge bay.

CAUTION! This connector can only go in one way. Ensure that the RED edge of the ribbon cable is toward the LEFT side of the opening.

NOTE: Before snapping the cartridge into place, you must position the wires so that they match up with the cable routing channel in the front panel.

7 Swing the top of the cartridge toward the front panel and push into place. Ensure that the thumb latch snaps securely into place to hold the cartridge.
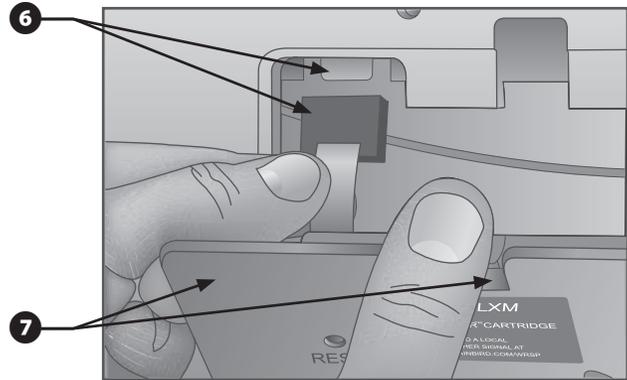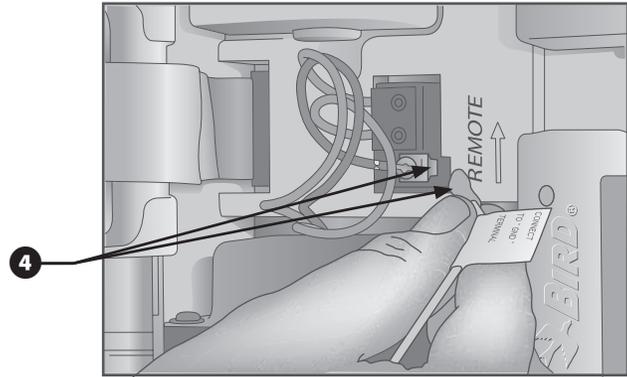
NOTE: When installing the ET Manager Cartridge, the ESP-LX Modular will display a blank screen for several minutes while the firmware is updated. If the screen remains blank for more than 15 minutes, turn the dial, if the screen is still blank, it may require a re-set. Press RESET on back of ETM. Do not power down the controller until firmware flash completes.

Route Cables and Complete Wiring

8 Press the green/yellow ground wire, and then the ET Manager Receiver/Antenna Cable firmly into the cable routing channel next to the ET Manager Cartridge.

CAUTION! Ensure that the ground wire and ET Manager Receiver Cable do not contact the transformer directly. Heat from the transformer may damage the insulation.

9 Close the front panel.
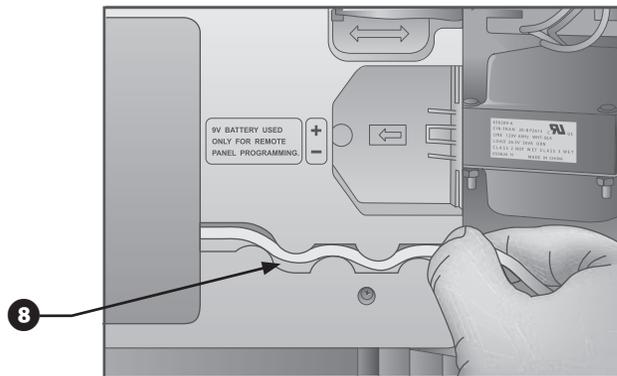
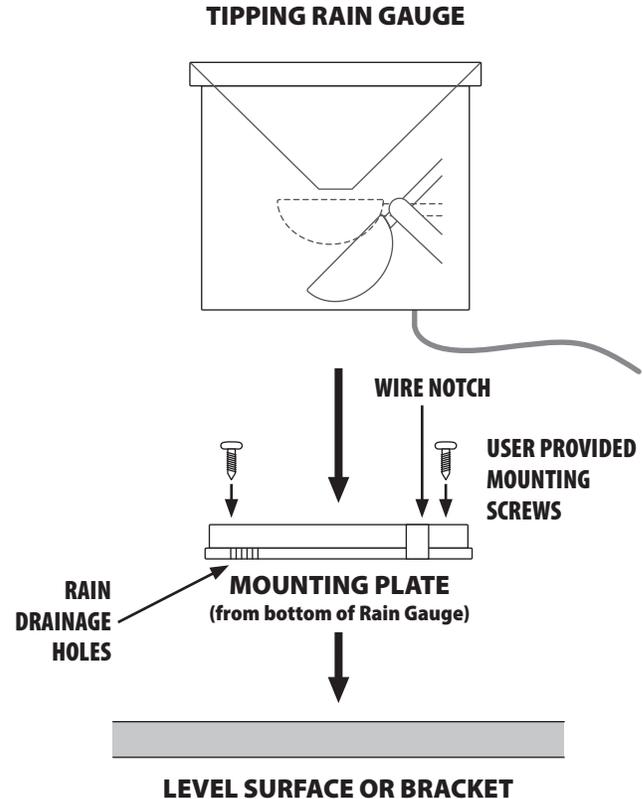*This page intentionally left blank.*

Install the Tipping Bucket Rain Gauge (optional)

Follow the Tipping Bucket Rain Gauge (ETM-RG) Installation Guide for proper mounting of the rain gauge. After the rain gauge is mounted properly, follow the steps outlined below.

⚠️ **NOTE:** When using the Tipping Bucket Rain Gauge, the ET Manager Cartridge must be programmed with the rain source set to "ETM-RG". See page 15 for programming instructions.

1 Unlatch the ET Manager Cartridge by pressing down on the latch and pulling forward.

2 Unplug the blue 2-wire terminal from the back of the ET Manager Cartridge.

3 Route the rain gauge wires through the knock-out on the bottom of the controller.

4 Use a flathead screwdriver to connect the rain gauge wires to the green 2-wire terminal. Give the wires a gentle tug to make sure they are securely connected.

TIPPING RAIN GAUGE

WIRE NOTCH

USER PROVIDED MOUNTING SCREWS

RAIN DRAINAGE HOLES

MOUNTING PLATE
(from bottom of Rain Gauge)

LEVEL SURFACE OR BRACKET

5 Plug the blue 2-wire terminal with wires connected back into the ET Manager Cartridge.

6 Insert the ET Manager Cartridge into the cartridge bay bottom edge first. Swing the top of the cartridge toward the front panel and push into place, ensuring that the thumb latch snaps securely into place.

7 Press the rain gauge wire firmly into the cable routing channel with the green/yellow ground wire, and the ET Manager Receiver/Antenna Cable.
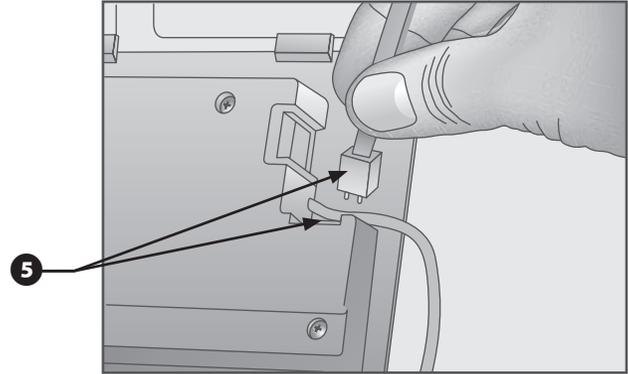
Controls And Indicators

User Interface

The ET Manager Cartridge is installed in the back of the LXM Controller front panel. When the LXM dial is set to the ET Manager / IQ Settings (older versions COMMUNICATIONS) position, the display and soft-keys are controlled by the ET Manager Cartridge. The User Interface is comprised of program status screens and menu screens, from which you can select various settings, logs and status screens.

Light Emitting Diode (LED) lights appear on the right side of the ET Manager Cartridge. LEDs provide continuous status updates and illuminate according to the table below:
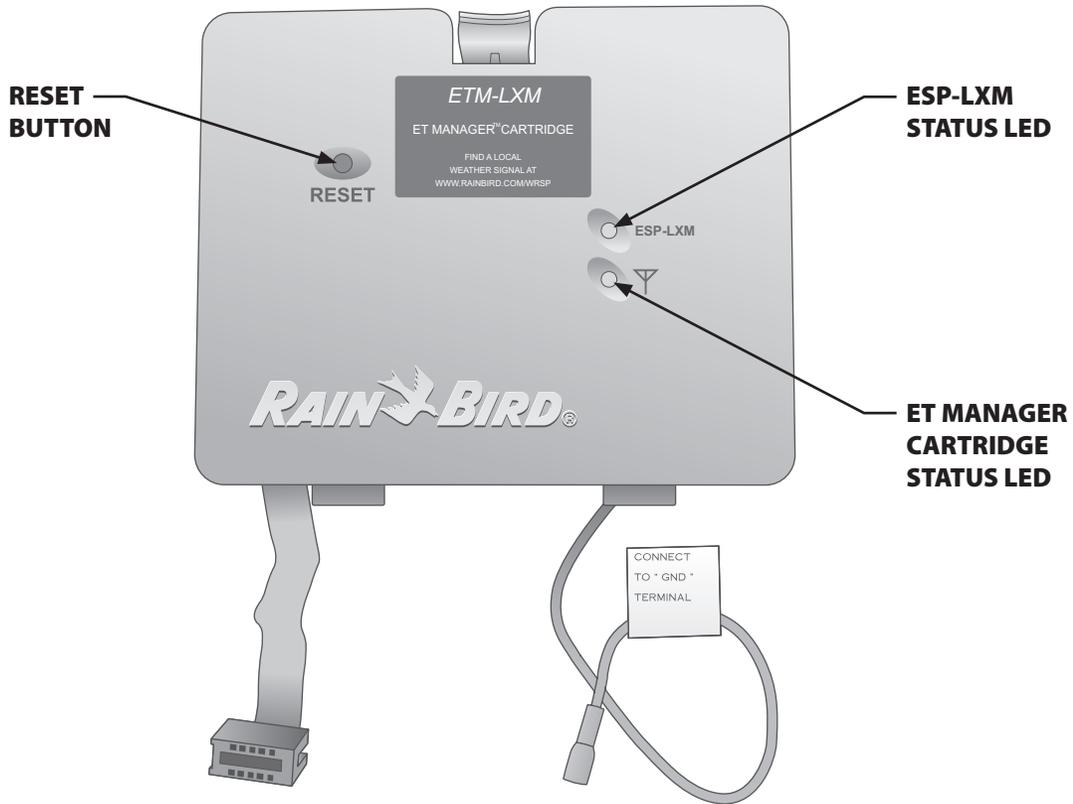
Color	Indication	Activity
None	(dark)	No Power
Upper light Red	Blinking	Power is present – communication between LXM and ETC is absent.
Lower light Red	Blinking	Power is present – communication between ETR and ETC is absent.
Upper light Green	Solid	Power and communications are Ok.
Lower light Green	Solid	Power and communications are Ok.
Both lights Green	Blinking	A Rain Gauge input was detected.

Resetting The ET Manager Cartridge

A Reset button is provided on the face of the ETC-LXM communications interface cartridge. The purpose of this control button is to restart the cartridge's internal programming and re-enable communications with the IQ Central Control Software.

NOTE: Resetting the ETC-LXM cartridge does not affect internally stored data such as event logs, WRSP signal provider codes or other settings.

RESET
BUTTON

ESP-LXM
STATUS LED

ETM-LXM

ET MANAGER™CARTRIDGE

FIND A LOCAL
WEATHER SIGNAL AT
WWW.RAINBIRD.COM/WRSP

RESET

ESP-LXM

ET MANAGER
CARTRIDGE
STATUS LED

RAIN BIRD.

CONNECT
TO " GND "
TERMINAL

Basic Programming

The ET Manager Scheduler software found on the ET Manager Cartridge Resource CD will walk you through all settings for both the ESP-LX Modular Controller and the ET Manager Cartridge.

Programming The ESP-LX Modular Controller

Begin by completing programming for ESP-LX Modular Controller: Please refer to your ESP-LX Modular Controller Installation, Programming, & Operation Guide.

It is recommended that your ESP-LX Modular Controller be programmed with start and run times that your landscape would need during the hottest, driest part of the year. You will need to determine the approximate amount of water applied in inches (or millimeters) for a single start time.

The ET Manager Cartridge will set the Seasonal Adjust percentage to adjust the peak of the season watering schedule to meet watering needs based on current weather information.

⚠️ **NOTE:** It is important to keep all run times for a valve on one Program. For example do not turn Valve 1 on with both Programs A and B.

ET Manager Resource CD

The ET Manager Cartridge features an EZ Setup Wizard to simplify the programming process (turn the dial to ET Manager / IQ Communications).

The EZ Setup Wizard consists of the essential settings which are necessary to receive the weather signal and to manage irrigation. Resources available to determine these settings can be found on:

- The ET Manager Scheduler software on the CD included with your ET Manager Cartridge.
- A Weather Reach Signal Provider Information Sheet which can be obtained from your Rain Bird Distributor, your installation contractor, or via PDF download at www.rainbird.com/wrsp.
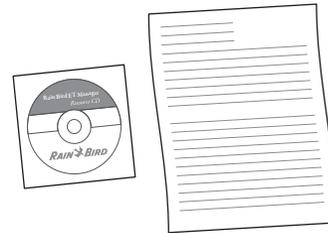
The ET Manager Scheduler software is recommended to assist you in determining settings for both the ESP-LX Modular Controller and the ET Manager Cartridge.

If you do NOT use the ET Manager Scheduler Software to determine your settings you will need the following information;

Input from the Weather Reach Signal Provider Information Sheet:

- Signal Provider Code
- Preferred Weather Region number
- Approximate Elevation
- Average Daily Historical ET values for each Month

Based on the amount of water applied in inches (or mm) per program start time:

- Irrigation Amount

The Irrigation Amount setting is the amount of water applied by the sprinkler system per program start time. For more information on determining the proper irrigation amount setting, see Appendix.
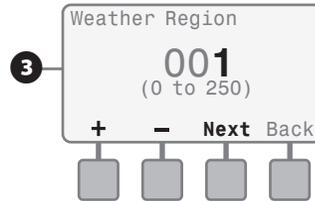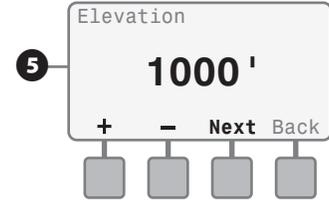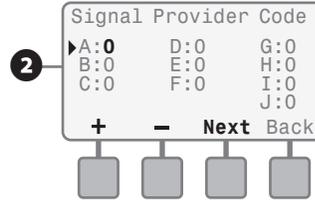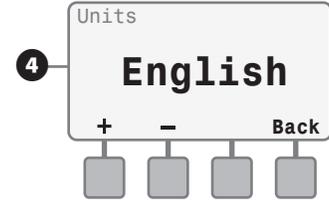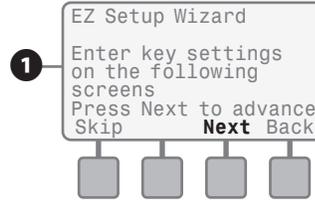
EZ Setup Wizard

To begin programming your essential settings with the EZ Setup Wizard follow these steps:

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS). The EZ Setup Wizard will be displayed. Press **Next**.

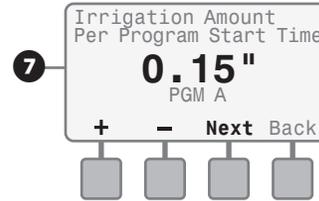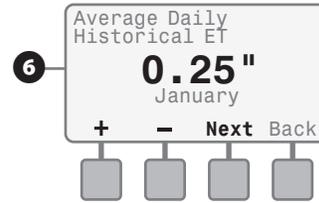⚠️ **NOTE:** If the EZ Setup Wizard is NOT displayed, press the EZ button from the Moisture Levels screen.

2 Enter the Signal Provider Code from the Weather Reach Signal Provider Information Sheet by using the **+ or -** buttons to change the value and the **Next** and **Back** buttons to move from one letter to the next. When finished, press **Next**.

3 Select the correct Weather Region number using the **+ or -** buttons to change the value. When finished, press **Next.**

4 Select the preferred unit of measure, English or Metric.

5 Program the approximate site elevation using the **+ or -** buttons to change the value . When finished, press **Next**.

1
```
EZ Setup Wizard

Enter key settings
on the following
screens
Press Next to advance
 Skip        Next Back
```

2
```
Signal Provider Code
▶A:0      D:0      G:0
 B:0      E:0      H:0
 C:0      F:0      I:0
                   J:0

 +    −    Next Back
```

3
```
Weather Region
      001
    (0 to 250)


 +    −    Next Back
```

4
```
Units

     English

 +    −          Back
```

5
```
Elevation

     1000'

 +    −    Next Back
```

6 Enter the daily Historical ET average for each month using the **+ or -** buttons to change the values. Historical ET data is used as backup. Press **Next** to go to the next month. When finished, press **Next**.

7 Program the Irrigation Amount Per Program Start using the **+ or -** buttons to change the values, press **Next** to go to the next Program. (See Appendix for how to determine this setting).
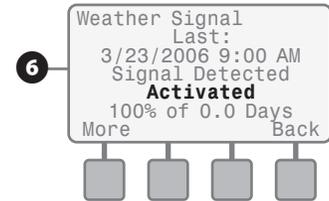
⚠ **NOTE:** Programs which you do NOT want watered based on evaporation must be set to "Non ET" by pressing the "-" button until 0.00 is reached then one more "-" button press will display "Non ET".

6
```
Average Daily
Historical ET
      0.25"
      January
 +    —    Next Back
```

7
```
Irrigation Amount
Per Program Start Time
      0.15"
       PGM A
 +    —    Next Back
```

Test Weather Signal

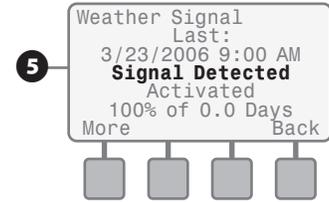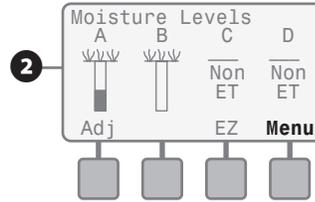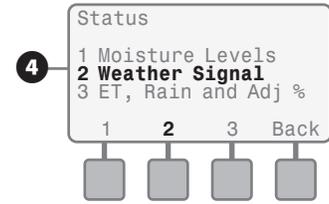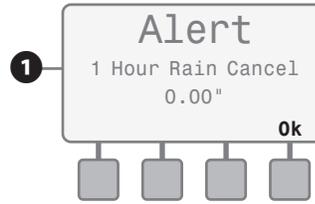**To verify that your ET Manager Cartridge is ready to receive weather data, check the Weather Signal Screen:**

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), Press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **1** Status.

4 Press **2** Weather Signal

5 Check the status of the signal, if the display shows "**Signal Detected**" the unit is ready to receive weather information.

- If the status displays "No Signal Detected" wait two minutes, if the status continues to display "No Signal Detected", go to page 35 and follow the steps for "No Paging Signal Detected".

6 If the activation status shows "**Activated**" your ET Manager will begin receiving hourly weather data.

1
```
        Alert
   1 Hour Rain Cancel
        0.00"
                      Ok
```

2
```
Moisture Levels
   A    B    C    D
  ᗲᗭᗲ  ᗲᗭᗲ  ───  ───
             Non  Non
             ET   ET
Adj         EZ   Menu
```

3
```
ET Manager      0.64
1 Status
2 Logs
3 Settings

   1    2    3    Back
```

4
```
Status
1 Moisture Levels
2 Weather Signal
3 ET, Rain and Adj %

   1    2    3    Back
```

5
```
Weather Signal
      Last:
 3/23/2006 9:00 AM
  Signal Detected
     Activated
 100% of 0.0 Days
More             Back
```

6
```
Weather Signal
      Last:
 3/23/2006 9:00 AM
  Signal Detected
     Activated
 100% of 0.0 Days
More             Back
```
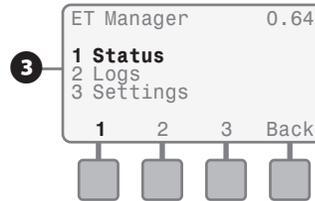
- If the activation status shows "Not Activated" you will need to contact your Weather Reach Signal Provider to establish services, they will activate your unit. Once activated the ETR will begin receiving hourly weather data.
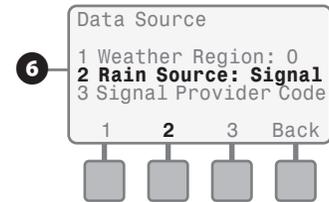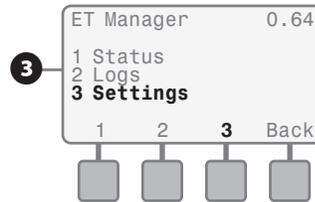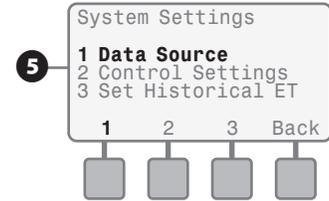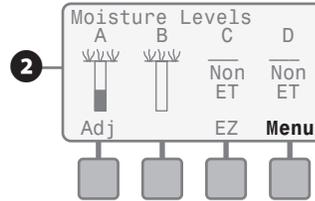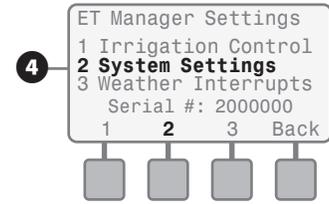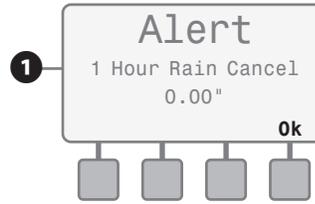
⚠️ **NOTE:** To find your local Weather Reach Signal Provider, contact your Rain Bird Distributor, your installation contractor, or go to www.rainbird.com/wrsp.

Tipping Bucket Rain Gauge Programming

If you have installed the Tipping Bucket Rain Gauge (ETM-RG), you must set the ET Manager Cartridge Rain Source to "ETM-RG".

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), Press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **3** Settings.

4 Press **2** System Settings.

5 Press **1** Data Source.

6 Press **2** Rain Source.

1
```
          Alert
    1 Hour Rain Cancel
         0.00"
                      Ok
```

2
```
Moisture Levels
   A    B    C    D
  ᘘᘘ   ᘘᘘ  ───  ───
             Non  Non
              ET   ET
Adj        EZ    Menu
```

3
```
ET Manager      0.64

1 Status
2 Logs
3 Settings

    1    2    3   Back
```

4
```
ET Manager Settings
1 Irrigation Control
2 System Settings
3 Weather Interrupts
  Serial #: 2000000
    1    2    3   Back
```

5
```
System Settings

1 Data Source
2 Control Settings
3 Set Historical ET

    1    2    3   Back
```

6
```
Data Source

1 Weather Region: 0
2 Rain Source: Signal
3 Signal Provider Code

    1    2    3   Back
```

7 Use the **+ or -** buttons to select Local Gauge. If the display shows Local Gauge ETM-RG you are done.

- If the display shows Local Gauge 0.01" / Tip, continue with Step 8 by pressing **More.**

8 Use the **+ or -** button to select ETM-RG, press **Back** until the Moisture Levels screen appears, or turn dial to Auto for 2 seconds, then Back to ET MANAGER / IQ SETTINGS.

7
```
Rain Source
Local Gauge
   ETM-RG (1mm/Tip)
+    −    More  Back
```

8
```
Rain Source
   Local Gauge
   ETM-RG
+    −         Back
```
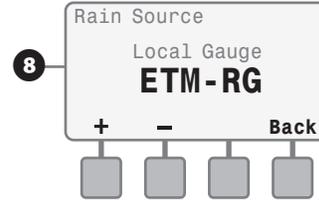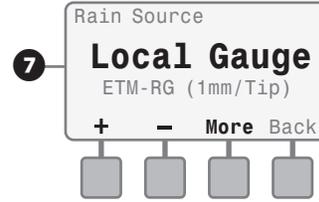
Operation

Once the ET Manager Cartridge has been programmed, it will begin managing your watering schedules based on the information it receives in the weather signal and settings tied to landscape conditions and sprinkler system capabilities.

The ET Manager Cartridge will change the ESP-LX Modular Controller's Seasonal Adjust percentage before each Program Start Time to reflect watering needs.

Routine Operations

Manual Watering

When the need arises to manually run a Program, turning the dial to Manual Watering and starting a Program will automatically set that Program's Seasonal Adjust percentage to 100%. Just prior to the next scheduled start time, the ET Manager Cartridge will change the Seasonal Adjust percentage to reflect the current Moisture Level.

⚠️ **NOTE:** Manual watering is NOT tracked by the ET Manager Cartridge, the ET Manager Cartridge will calculate watering needs as if the manual watering had not occurred.

Logs and Status

The ET Manager Cartridge keeps several logs including current irrigation status and a history of irrigation events as well as current weather information, and a history of interrupts. The following pages describe these logs and status screens and how to access them.

Additional Features

Store and Recall Programs

The ESP-LX Modular feature to store and recall programs will store and recall ET Manager Cartridge settings as well. See your ESP-LX Modular Controller Installation, Programming, & Operation Guide for instructions on how to store and recall programs.

Quick Adjust

If you notice the landscape is too dry or wet, here are a few suggestions;

Dry or wet spots:

- Check the sprinkler heads near the spot that is dry or wet.
- Check the run times for the zone watering the dry or wet spot.

Dry or wet stations or zone:

- Confirm the zone is operating properly.
- Adjust the run time for the zone using small intervals of time (1-2 minutes).

Several stations in a Program are too dry or too wet:

- Check the Irrigation Amount, see Appendix Determining the Irrigation Amount.
- Adjust the run time for the program using small intervals of time (1-2 minutes).

Water the next scheduled cycle:

- Set the Moisture Levels for the selected Program(s) to 0 (see page 25).

Irrigation Status

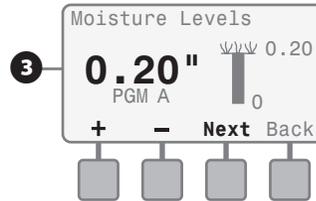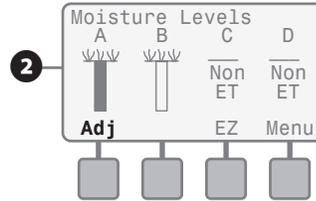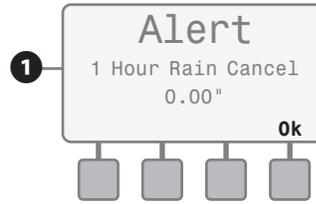**Current irrigation status is easily viewed by looking at the Moisture Level for each program.**

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), press **Ok** thru any Alert messages.

2 The Moisture Levels screen is displayed showing Moisture Level status for each program, this gives you an idea of how wet or dry your landscape is.

In the image at the right, Program A's Moisture Level is full while Program B's Moisture Level is getting low (or drying out). Each program's Moisture Level may be manually adjusted by pressing **Adj**.

3 The current Moisture Level and Total Irrigation Amount (including all start times) for PGM A is displayed. Use the **+ or -** buttons to manually adjust the Moisture Level. Press **Next** to view the next Program's Moisture Level and Back to return to the Moisture Levels screen.

⚠ **NOTE:** An empty soil Moisture Level is an indication that water from the last watering event has evaporated, it is not an indication that the soil has completely dried out.

1
```
        Alert
   1 Hour Rain Cancel
        0.00"
                    Ok
```

2
```
  Moisture Levels
    A    B    C    D
   ⋁⋁⋁  ⋁⋁⋁  ___  ___
              Non  Non
              ET   ET
   Adj        EZ   Menu
```

3
```
  Moisture Levels
                 ⋁⋁⋁ 0.20
   0.20"
    PGM A        0
   +    —    Next  Back
```

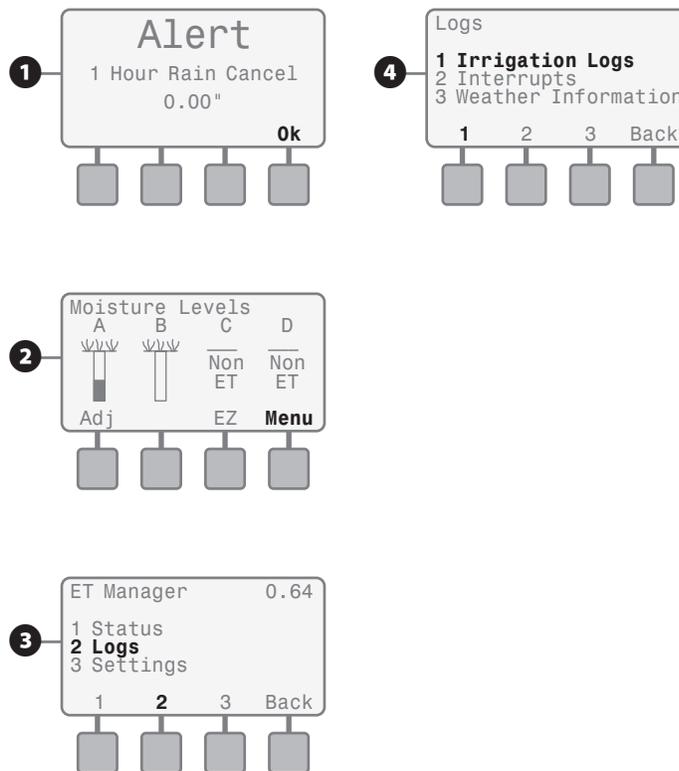*This page intentionally left blank.*

Irrigation Logs

The ET Manager Cartridge displays the number of watering days that have occurred as well as an estimated amount of water applied in inches for each program.
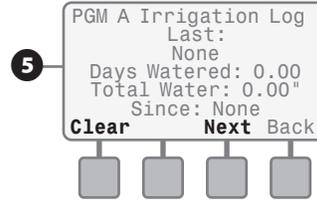
1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **2** Logs.

4 Press **1** Irrigation Logs.

PGM A Irrigation Log is displayed including the last irrigation event that occurred, number of days watered and total estimated amount of water applied in inches since the date at the bottom. The "Since" date shows the date that this information began to calculate from.

The number of days watered is figured by number of completed starts. For example, if the ET Manager Cartridge determines that only 2 of the 3 programmed start times are necessary, the number of watering days added to this log will be 0.66 (2/3 of a typical days watering starts).
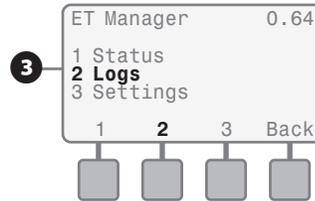
1
```
          Alert
     1 Hour Rain Cancel
          0.00"
                       Ok
```

4
```
Logs
1 Irrigation Logs
2 Interrupts
3 Weather Information
    1     2     3    Back
```

2
```
Moisture Levels
  A    B    C    D
 \|/  \|/  ___  ___
            Non  Non
            ET   ET
Adj          EZ  Menu
```

3
```
ET Manager       0.64
1 Status
2 Logs
3 Settings
    1     2     3    Back
```
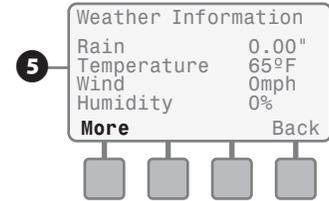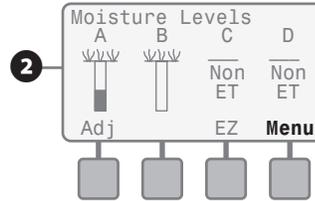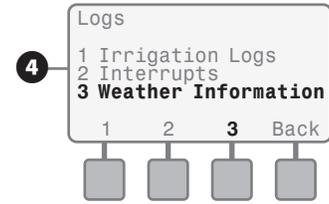
5 To clear the log and begin counting at 0 watering days and 0.00 water applied, press **Clear**. The log will display the "Since" date as today's date, the last watering will display none, and the rest of the information will display none or days watered and total water will display 0. Press **Next** to view the next program's Irrigation Log.

5

```
PGM A Irrigation Log
       Last:
       None
 Days Watered: 0.00
 Total Water: 0.00"
     Since: None
Clear       Next Back
```

Weather Information

The weather information received by the ET Manager Cartridge may be viewed by following these steps:

① Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), press **Ok** thru any Alert messages.

② Press **Menu**.

③ Press **2** Logs.

④ Press **3** Weather Information.

⑤ Weather Information which was received in the most recent weather signal is displayed; more information about each category can be viewed by pressing **More**.

①
```
          Alert
     1 Hour Rain Cancel
          0.00"
                      Ok
```

④
```
Logs
1 Irrigation Logs
2 Interrupts
3 Weather Information
   1    2    3    Back
```

②
```
Moisture Levels
  A    B    C    D
 ♨    ♨    ──   ──
            Non  Non
            ET   ET
Adj        EZ   Menu
```

⑤
```
Weather Information
Rain           0.00"
Temperature    65ºF
Wind           0mph
Humidity       0%
More               Back
```

③
```
ET Manager      0.64
1 Status
2 Logs
3 Settings
   1    2    3    Back
```
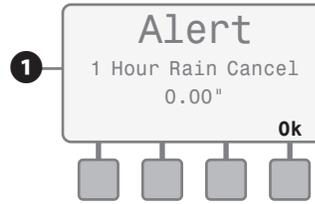
6 Press **Next** to access the next weather category.

⚠️ **NOTE:** Values displayed as being "Last Hour" are updated each time a weather signal is received.

a.
```
Rain
Last Hour       0.00"
Last 24 Hours   0.00"
Last 7 Days     0.00"
Last 14 Days    0.00"

                 Next  Back
```

b.
```
Temperature
Current        65ºF
High           69ºF
Low            61ºF

                 Next  Back
```

c.
```
Wind
Current        0mph
High           0mph
Low            0mph

                 Next  Back
```

d.
```
Humidity
Current         0%
High            0%
Low             0%

                 Done  Back
```
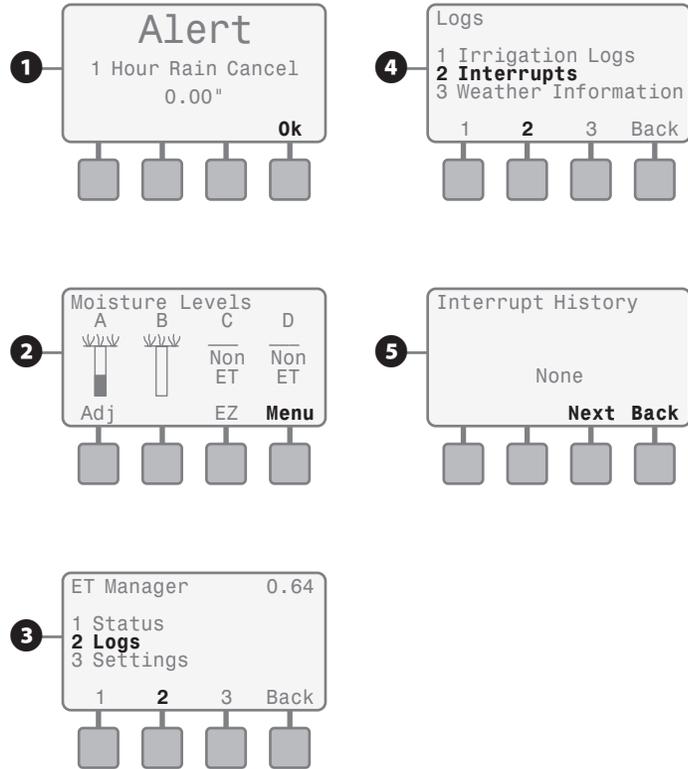
Interrupt History

The ET Manager Cartridge can cancel irrigation for high winds, freezing temperatures, rain, and "Provider Interrupts" (see the Trouble Shooting Guide). Interrupt History displays the start and/or cleared date and time as well as type of interrupts for the last 5 interrupt events that have occurred. This history may be viewed by following these steps:

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **2** Logs.

4 Press **2** Interrupts.

5 Interrupt History is displayed showing the type of interrupt and the date and time the interrupt started or cleared. To view next Interrupt, press **Next**. To return to the Logs menu, press **Back**.

⚠️ **NOTE:** If no interrupt events have occurred, the Interrupt History will display "None".

1
```
        Alert
   1 Hour Rain Cancel
         0.00"
                    Ok
```

2
```
Moisture Levels
  A    B    C    D
 \|/  \|/
             Non  Non
             ET   ET
Adj        EZ   Menu
```

3
```
ET Manager      0.64
1 Status
2 Logs
3 Settings
   1    2    3   Back
```

4
```
Logs
1 Irrigation Logs
2 Interrupts
3 Weather Information
   1    2    3   Back
```

5
```
Interrupt History

       None
             Next  Back
```

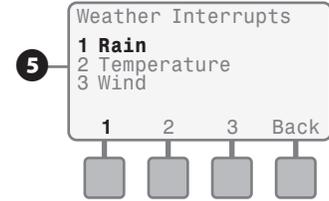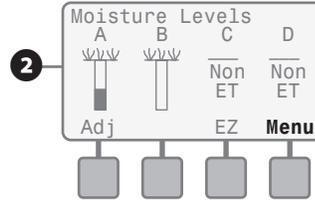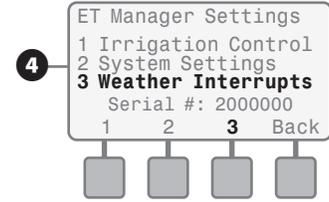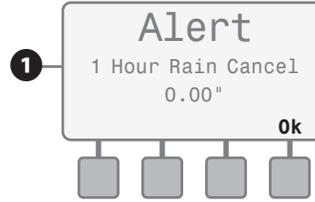*This page intentionally left blank.*

Advanced Programming

Once the key settings in the EZ Setup Wizard are entered, the ET Manager Cartridge will begin managing your landscape watering based on weather information. There are a number of other settings which can be used to further customize your sprinkler system including weather interrupts and run time limits. This chapter addresses all available settings that were not discussed in Basic Programming.
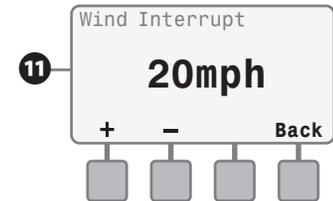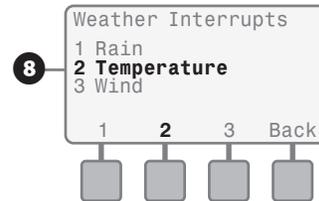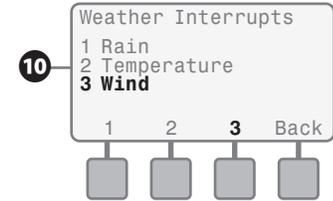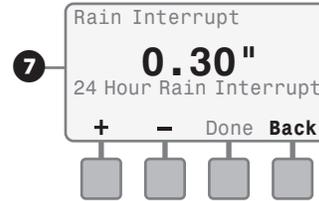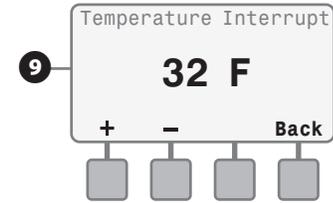
Weather Interrupts

The ET Manager Cartridge is able to cancel watering should unfavorable weather conditions arise. You decide how much wind or rain is required or how cold it must be to cancel watering. Default settings are as follows; 1 Hour Rain: 0.15; 24 Hour Rain: 0.30; Temperature: 30ºF; Wind: 20mph.

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), Press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **3** Settings.

4 Press **3** Weather Interrupts.

5 Press **1** for Rain.

1
```
         Alert
    1 Hour Rain Cancel
         0.00"
                     Ok
```

2
```
Moisture Levels
 A    B    C    D
\|/  \|/
            Non  Non
            ET   ET
Adj         EZ  Menu
```

3
```
ET Manager      0.64

1 Status
2 Logs
3 Settings
    1    2    3   Back
```

4
```
ET Manager Settings
1 Irrigation Control
2 System Settings
3 Weather Interrupts
  Serial #: 2000000
   1    2    3   Back
```

5
```
Weather Interrupts
1 Rain
2 Temperature
3 Wind

   1    2    3   Back
```
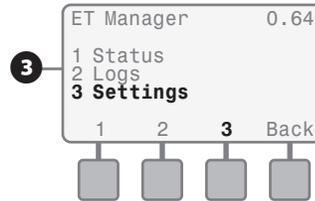
6 Use the **+ or -** to change the amount of rain that must be received within one hour to cause the sprinklers to shut off for one hour; then press **Next.**

7 Use the **+ or -** to change the amount of rain that must be received within a 24 hour period to cause the sprinklers to shut off until rain for the last 24 hours is below the setting. Press **Back** twice.

8 Press **2** for Temperature.

9 Use the **+ or -** to change the temperature that must be met to cause the sprinklers to shut off. Press **Back**.

10 Press **3** for Wind.

11 Use the **+ or -** buttons to change the wind speed that must be met to cause the sprinklers to shut off. Press **Back** until the Moisture Level screen appears , or turn dial to Auto for 2 seconds, then Back to ET MANAGER / IQ SETTINGS.

6
```
Rain Interrupt
       0.15"
1 Hour Rain Interrupt
  +    -    Next  Back
```

9
```
Temperature Interrupt
       32 F
  +    -         Back
```

7
```
Rain Interrupt
       0.30"
24 Hour Rain Interrupt
  +    -    Done  Back
```

10
```
Weather Interrupts
1 Rain
2 Temperature
3 Wind
   1    2    3    Back
```

8
```
Weather Interrupts
1 Rain
2 Temperature
3 Wind
   1    2    3    Back
```

11
```
Wind Interrupt
      20mph
  +    -         Back
```
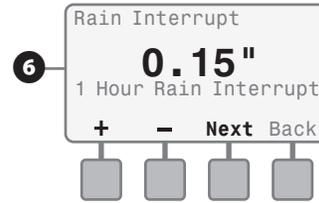
Run Time Limits

Run Time Limits controls the highest and lowest Seasonal Adjust percentage you want the ET Manager Cartridge to be able to set. Default Settings are Minimum Run Time: 80%, Maximum Run Time: 120%.

Minimum Run Time

The Minimum Run Time gives you the ability to decide the smallest percentage of your watering cycle you will allow to be applied to your landscape. Setting this percentage to a low number will mean that your ET Manager Cartridge will allow watering even if only a small amount of evaporation has occurred. Setting this percentage to a high number will delay watering until more evaporation has occurred, providing oxygen to the roots which will encourage them to grow deeper, without sacrificing the health of the plant.

Maximum Run Time

The Maximum Run Time gives you the ability to decide the largest percentage of your watering cycle you will allow to be applied to your landscape. There may be instances where your landscape has dried out more than a regular watering cycle will be able to replace. In this situation the ET Manager Cartridge will adjust the Seasonal Adjust percentage above 100% causing your sprinklers to run longer than their normally scheduled time. The Maximum Run Time may be helpful if there is a certain amount of time you want your watering to stay within.

If water days are limited, the ET Manager Cartridge looks ahead each day to determine if watering should occur, based on the last 24 hours of evaporation, even though the current Moisture Level has not yet met or dropped below minimum levels. In this situation, the ET Manager Cartridge will ignore the Minimum Run Time limit to fill the moisture level in preparation for the upcoming day(s) that are turned off.

⚠️ **NOTE:** The ET Manager Cartridge works to keep your Moisture Levels filled and will not set a Seasonal Adjust percentage that would cause the Moisture Level to go above the filled amount.
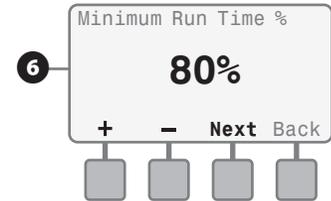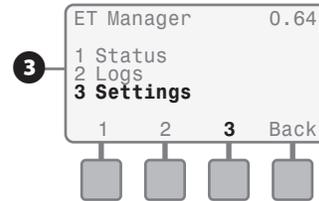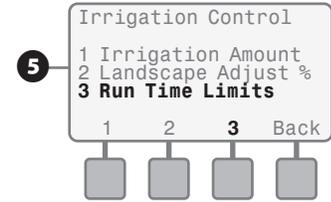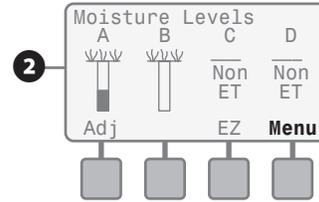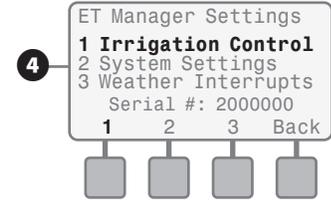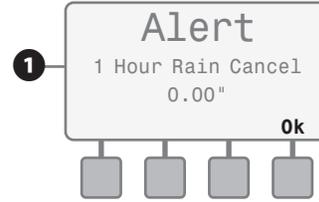
For Example: If the Minimum Run Time limit is set to 80% and Maximum Run Time limit is set to 120% with run times set to 10 minutes, the shortest run time that could occur would be 8 minutes, while the longest would be 12 minutes.
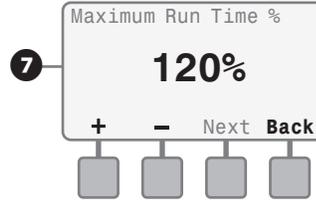
Programming Run Time Limits

① Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), Press **Ok** thru any Alert messages.

② Press **Menu**.

③ Press **3** Settings.

④ Press **1** Irrigation Control.

⑤ Press **3** Run Time Limits.

⑥ The Minimum Run Time % screen is displayed. Use the **+ or -** buttons to set the percentage you desire, then press **Next**.

⚠️ **NOTE:** To follow best water management practices of deep, less frequent watering, set the percentage at or above 80%.

①
```
         Alert
   1 Hour Rain Cancel
         0.00"

                    Ok
```

②
```
 Moisture Levels
   A    B    C    D
  ＼ｌ／ ＼ｌ／  ___  ___
              Non  Non
              ET   ET
 Adj        EZ   Menu
```

③
```
 ET Manager    0.64
 1 Status
 2 Logs
 3 Settings
    1    2    3  Back
```

④
```
 ET Manager Settings
 1 Irrigation Control
 2 System Settings
 3 Weather Interrupts
    Serial #: 2000000
    1    2    3  Back
```

⑤
```
 Irrigation Control
 1 Irrigation Amount
 2 Landscape Adjust %
 3 Run Time Limits
    1    2    3  Back
```

⑥
```
 Minimum Run Time %

        80%

  +    −   Next Back
```

7 The Maximum Run Time % screen is displayed. Use the **+ or -** buttons to set the percentage you desire. Press **Back** until the Moisture Levels screen appears, or turn dial to Auto for 2 seconds, then back to ET MANAGER / IQ SETTINGS.

```
Maximum Run Time %

         120%

+     −       Next  Back
```
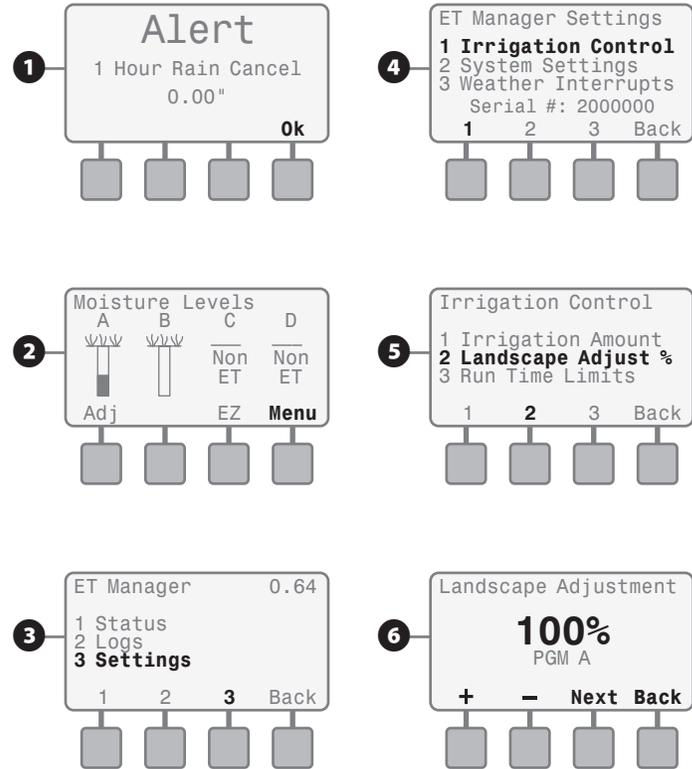
Landscape Adjustment Percentage

The Landscape Adjustment Percentage is used to adjust for site-specific landscape needs for each Program and is applied to the calculated ET. As a general rule the Landscape Adjustment Percentages should range between 60% - 100% for turf grass and 40% - 80% for shrubs. The default setting is 100% for all programs.

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), Press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **3** Settings.

4 Press **1** Irrigation Control.

5 Press **2** Landscape Adjust %

6 The Landscape Adjustment Percentages are shown for each Program starting with Program A. Use the **+ or -** buttons to set the percentage you desire. Press **Next** to go to the next Program's Landscape Adjustment Percentage.
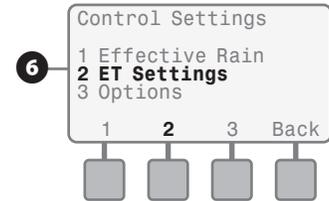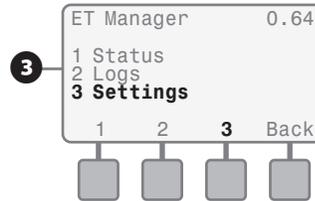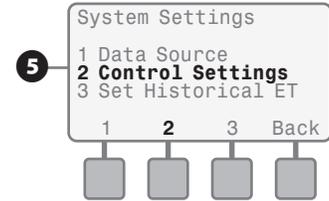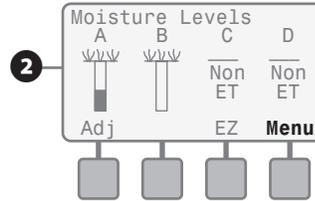
Press Back until the Moisture Levels screen appears, or turn the dial to Auto for 2 seconds, then back to ET Source.

1
```
          Alert
     1 Hour Rain Cancel
          0.00"
                        Ok
```

4
```
ET Manager Settings
1 Irrigation Control
2 System Settings
3 Weather Interrupts
   Serial #: 2000000
   1     2     3   Back
```

2
```
Moisture Levels
   A    B    C     D
  \|/  \|/  ___  ___
             Non   Non
             ET    ET
 Adj        EZ    Menu
```

5
```
Irrigation Control

1 Irrigation Amount
2 Landscape Adjust %
3 Run Time Limits

   1     2     3   Back
```

3
```
ET Manager       0.64

1 Status
2 Logs
3 Settings

   1     2     3   Back
```

6
```
Landscape Adjustment

      100%
      PGM A

 +     —    Next  Back
```

ET Source

The ET Manager can be set to operate using either the hourly weather signal, or historical ET data. The default setting is to use the weather signal.

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), Press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **3** Settings.

4 Press **2** System Settings.

5 Press **2** Control Settings.

6 Press **2** ET Settings.

1
```
        Alert
   1 Hour Rain Cancel
        0.00"
                    Ok
```

2
```
Moisture Levels
   A    B    C    D
  ___  ___
            Non  Non
            ET   ET
Adj         EZ   Menu
```

4
```
ET Manager Settings
1 Irrigation Control
2 System Settings
3 Weather Interrupts
  Serial #: 2000000
  1    2    3   Back
```

5
```
System Settings

1 Data Source
2 Control Settings
3 Set Historical ET

  1    2    3   Back
```

3
```
ET Manager      0.64

1 Status
2 Logs
3 Settings

  1    2    3   Back
```

6
```
Control Settings

1 Effective Rain
2 ET Settings
3 Options

  1    2    3   Back
```
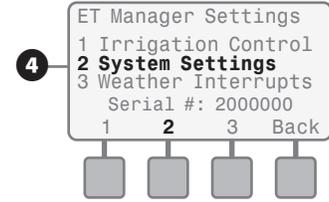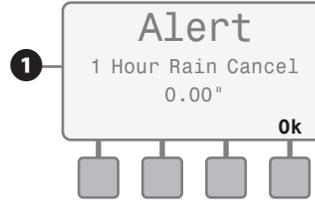
7 Press **1** ET Source.

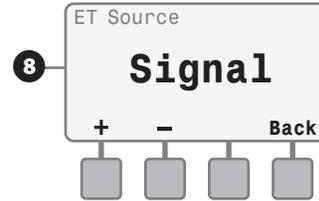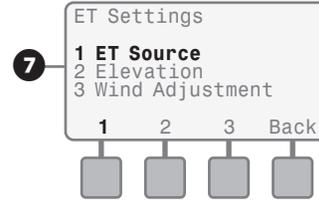**8** Use the **+ or -** buttons to change the setting toggles between Signal and Historical. Press **Back** until Moisture Levels screen appears, or turn dial to Auto for 2 seconds, then back to ET MANAGER / IQ SETTINGS.

⚠️ **NOTE:** When the ET Manager Cartridge is set to Historical ET, "H-ET" will be displayed in the upper right corner of the Moisture Levels screen as a reminder that the device is set to Historical ET to ET MANAGER / IQ SETTINGS.

```
ET Settings

1 ET Source
2 Elevation
3 Wind Adjustment

  1     2     3    Back
```

```
ET Source

     Signal

     +    —      Back
```
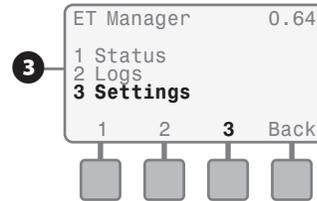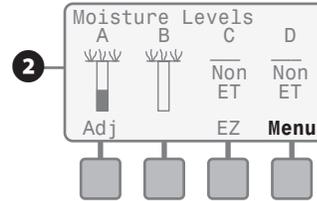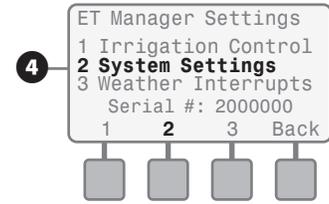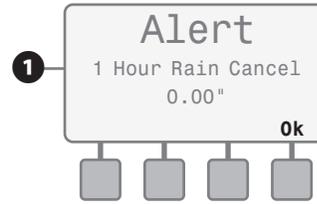
Effective Rain Settings

Effective rain is the amount of rain that is an available source of water for the plant. When rainfall amounts and intensities are extreme, not all rainfall will stay within the root zone. To restrict the amount of rain recognized by the system, two effective rainfall limits should be programmed: Max Hourly Rain and Saturation Allowance (for each program).
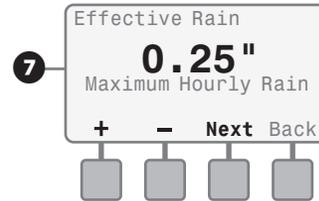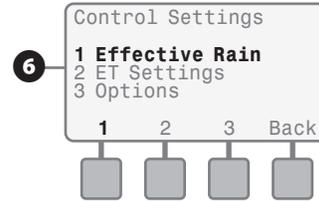
- The Maximum Hourly Rain is the maximum amount of rain that will be used in an hour to adjust the soil moisture level.

- The Saturation Allowance is the amount of rain it takes to saturate the soil after satisfying the total irrigation amount before run-off occurs. Unique Saturation Allowance settings can be made for each program and are typically programmed as half the total irrigation amount. Default settings are; Max Hourly Rain: 0.25; Saturation Allowance: 0.10 for all Programs.

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), Press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **3** Settings.

4 Press **2** System Settings.

5 Press **2** Control Settings.

6 Press **1** Effective Rain.

7 Maximum Hourly Rain setting appears, use the **+ or -** buttons to adjust the setting. Press **Next**.

8 Saturation Allowance setting for Program A appears, use the **+ or -** buttons to adjust the setting and press **Next** to view the next program.

When finished, press **Back** until the Moisture Levels screen appears, or turn dial to Auto for 2 seconds, then back to ET MANAGER / IQ SETTINGS.

5
```
System Settings

1 Data Source
2 Control Settings
3 Set Historical ET

   1    2    3    Back
```

8
```
Effective Rain

    0.10"
Saturation Allowance
     PGM A
  +    —   Next  Back
```

6
```
Control Settings

1 Effective Rain
2 ET Settings
3 Options

   1    2    3    Back
```

7
```
Effective Rain

    0.25"
Maximum Hourly Rain

  +    —   Next  Back
```
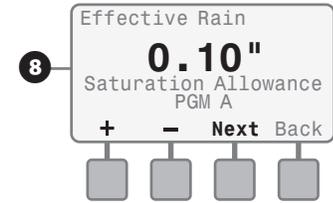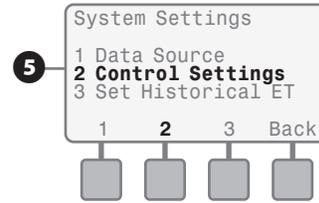
Rain Region

Rainfall data is received by the ET Manager Cartridge in the hourly weather signal or from an optional on-site rain gauge. Another option for rain data is a Rain Region. Like the weather region number, a rain region number represents a rain gauge accessed by the Weather Reach Signal Provider who then broadcasts the rain region data. The user programs the rain region number to correspond to a rain region that closely represents rainfall for the location of the ET Manager Cartridge. To determine if a Rain Region is available in your area, refer to the Signal Provider Information Sheet for your signal provider.

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), Press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **3** Settings.

4 Press **2** System Settings.

5 Press **1** Data Source.

6 Press **2** Rain Source.

1
```
          Alert
      1 Hour Rain Cancel
           0.00"
                        Ok
```

2
```
Moisture Levels
  A    B    C    D
 ___  ___  ___  ___
           Non  Non
           ET   ET
 Adj       EZ  Menu
```

3
```
ET Manager      0.64
1 Status
2 Logs
3 Settings
   1    2    3   Back
```

4
```
ET Manager Settings
1 Irrigation Control
2 System Settings
3 Weather Interrupts
  Serial #: 2000000
   1    2    3   Back
```

5
```
System Settings
1 Data Source
2 Control Settings
3 Set Historical ET
   1    2    3   Back
```

6
```
Data Source
1 Weather Region: 0
2 Rain Source: Signal
3 Signal Provider Code
   1    2    3   Back
```
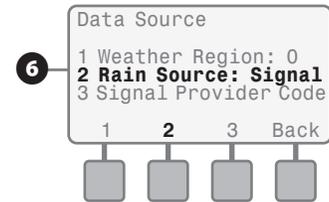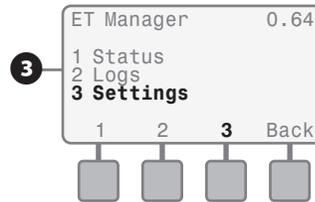
7 Use the **+ or -** to select Rain Region. Press **Edit.**

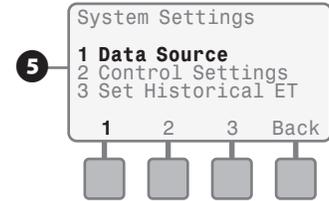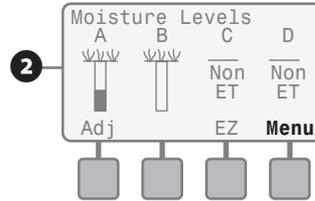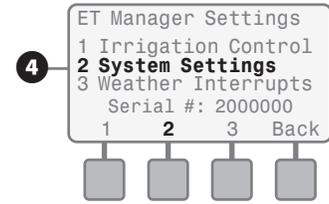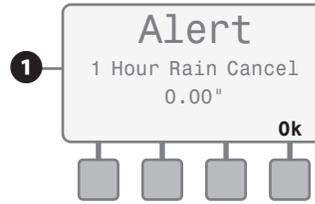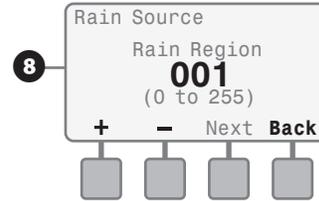**8** Use the **+ or -** to select the appropriate Rain Region number. Press **Back** until the Moisture Levels screen appears, or turn dial to Auto for 2 seconds, then back to ET MANAGER / IQ SETTINGS.
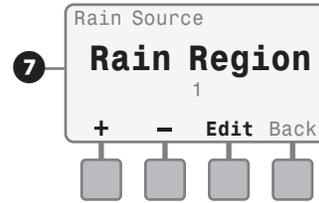
7
```
Rain Source

Rain Region
       1

 +    −   Edit Back
```

8
```
Rain Source

   Rain Region
      001
    (0 to 255)

 +    −   Next Back
```

Local Rain Gauge 0.01"/ tip

The ET Manager Cartridge accepts rainfall input from both 1mm/tip and 0.01"/tip rain gauges. Programming for a 1mm/tip rain gauge can be found on page 16. To program the ET Manager Cartridge for use with a 0.01"/tip rain gauge follow the steps outlined below:

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), Press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **3** Settings.

4 Press **2** System Settings.

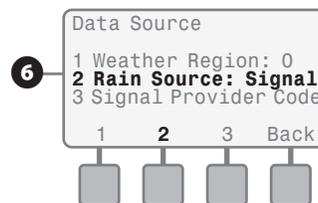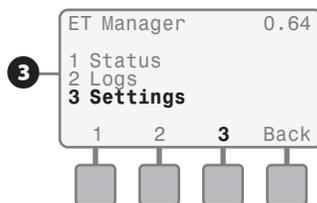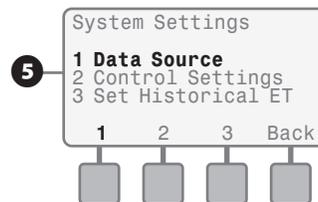**5** Press **1** Data Source.
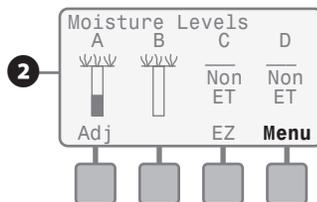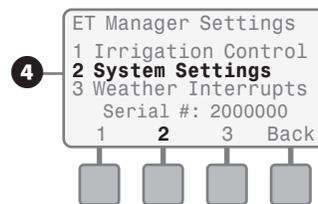
6 Press **2** Rain Source.

1
```
            Alert
     1 Hour Rain Cancel
          0.00"
                        Ok
```

2
```
Moisture Levels
   A    B    C    D
  \|/  \|/  ___  ___
  ▮    ▯    Non  Non
            ET   ET
Adj        EZ   Menu
```

3
```
ET Manager      0.64

1 Status
2 Logs
3 Settings
    1    2    3    Back
```

4
```
ET Manager Settings
1 Irrigation Control
2 System Settings
3 Weather Interrupts
  Serial #: 2000000
    1    2    3    Back
```

5
```
System Settings

1 Data Source
2 Control Settings
3 Set Historical ET
    1    2    3    Back
```

6
```
Data Source

1 Weather Region: 0
2 Rain Source: Signal
3 Signal Provider Code
    1    2    3    Back
```
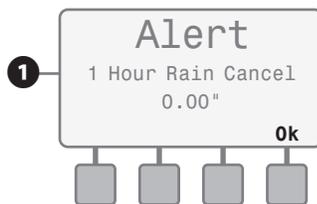
7. Use the **+ or -** to select Local Gauge. Press **More**.

8. Use the **+ or -** to select "0.01" / Tip". Press **Back** until the Moisture Levels screen appears, or turn dial to Auto for 2 seconds, then back to ET MANAGER / IQ SETTINGS.
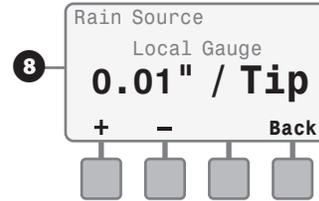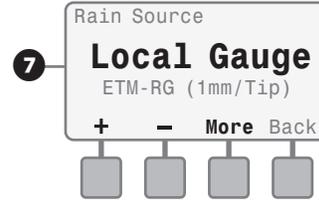
7
```
Rain Source

Local Gauge
 ETM-RG (1mm/Tip)

 +     −    More Back
```

8
```
Rain Source
   Local Gauge
 0.01" / Tip

 +     −         Back
```

Units English/Metric

The ET Manager Cartridge can calculate and display values in either English or Metric units. The default setting is to English units.

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), Press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **3** Settings.

4 Press **2** System Settings.

5 Press **2** Control Settings.

6 Press **3** Options.

1
```
        Alert
   1 Hour Rain Cancel
        0.00"
                    Ok
```

2
```
Moisture Levels
   A    B    C    D
  ⱴⱴⱴ  ⱴⱴⱴ  ───  ───
            Non  Non
            ET   ET
Adj        EZ   Menu
```

3
```
ET Manager      0.64
1 Status
2 Logs
3 Settings
     1    2    3  Back
```

4
```
ET Manager Settings
1 Irrigation Control
2 System Settings
3 Weather Interrupts
  Serial #: 2000000
     1    2    3  Back
```

5
```
System Settings
1 Data Source
2 Control Settings
3 Set Historical ET
     1    2    3  Back
```

6
```
Control Settings
1 Effective Rain
2 ET Settings
3 Options
     1    2    3  Back
```
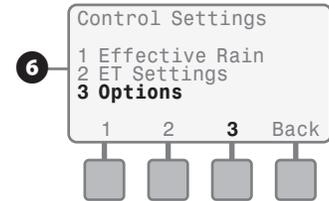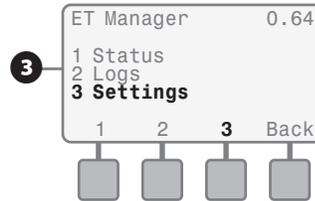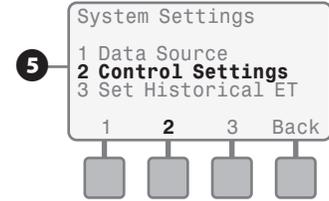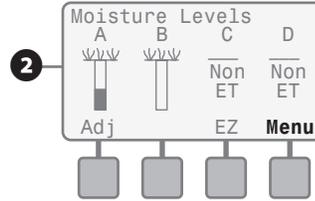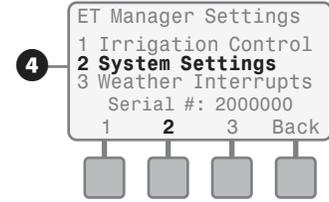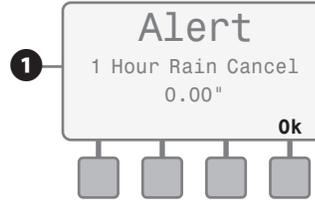
7 Press **1** Units.

8 Use the **+ or -** buttons to change the setting toggles between English and Metric. Press **Back** until Moisture Levels screen appears, or turn dial to Auto for 2 seconds, then back to ET MANAGER / IQ SETTINGS.

```
Options

1 Units
2 Signal Kc
3 Clear Data

   1      2      3    Back
```

7

```
Units

    English

    +      −          Back
```

8

Clear Data

If it becomes necessary, you may clear all records stored in the ET Manager Cartridge. Clearing Data will not change the settings, but will erase al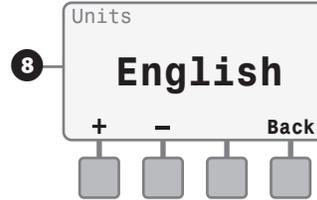l weather information, paging history, interrupt history, and irrigation logs, and will reset your Moisture Levels to 0, allowing the next cycle to water.

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), Press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **3** Settings.

4 Press **2** System Settings.

5 Press **2** Control Settings.

6 Press **3** Options.

1
```
        Alert
   1 Hour Rain Cancel
        0.00"
                    Ok
```

2
```
Moisture Levels
   A    B    C    D
  ψψ   ψψ   ___  ___
             Non  Non
             ET   ET
Adj         EZ   Menu
```

3
```
ET Manager      0.64
1 Status
2 Logs
3 Settings
    1    2    3   Back
```

4
```
ET Manager Settings
1 Irrigation Control
2 System Settings
3 Weather Interrupts
  Serial #: 2000000
    1    2    3   Back
```

5
```
System Settings
1 Data Source
2 Control Settings
3 Set Historical ET
    1    2    3   Back
```

6
```
Control Settings
1 Effective Rain
2 ET Settings
3 Options
    1    2    3   Back
```
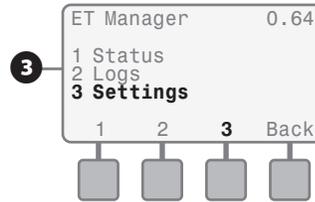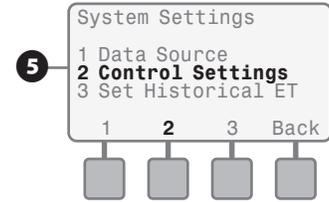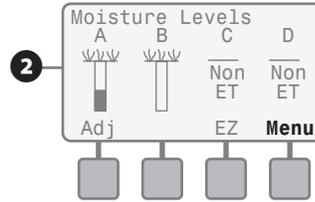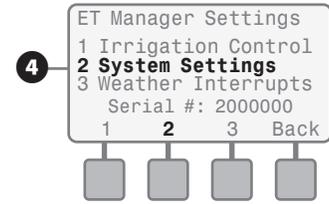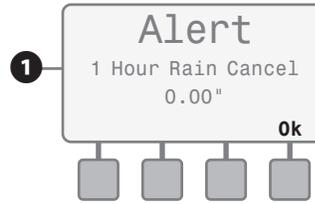
7 Press **3** Clear Data.

8 A message will appear asking if you want to clear all data. Press **Yes** to clear data, press **Back** to keep data and return to the previous screen.

9 If you press Yes, a message will appear asking you to please wait.

10 Once data has cleared, a "Data Cleared" message will appear, press **Back** until the Moisture Levels screen appears, or turn dial to Auto for 2 seconds, then back to ET MANAGER / IQ SETTINGS.
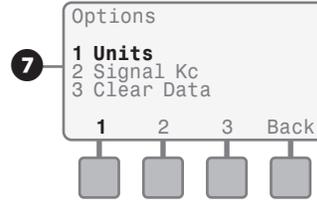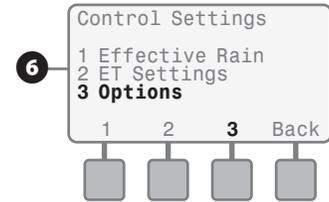
7
```
Options
1 Units
2 Signal Kc
3 Clear Data

  1    2    3    Back
```

10
```
          Data
        Cleared

                    Back
```

8
```
Clear Data
Clear all Weather
history, moisture
levels, and logs?

Yes            Back
```

9
```
   Clearing Data;
    Please Wait
```

Signal Kc

Signal Kc (or Signal Crop Coefficient) is used by the Weather Reach Signal Provider to modify ET to a specific crop and can change over the year due to seasonal conditions. You can choose to "Use" or "Ignore" this adjustment. Default setting is to Use the Signal Kc.

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), Press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **3** Settings.

4 Press **2** System Settings.

5 Press **2** Control Settings.

6 Press **3** Options.

1
```
          Alert
     1 Hour Rain Cancel
           0.00"
                        Ok
```

2
```
Moisture Levels
   A    B    C    D
  ___  ___  ___  ___
                Non  Non
                ET   ET
 Adj        EZ   Menu
```

3
```
ET Manager      0.64

1 Status
2 Logs
3 Settings
      1    2    3    Back
```

4
```
ET Manager Settings
1 Irrigation Control
2 System Settings
3 Weather Interrupts
   Serial #: 2000000
      1    2    3    Back
```

5
```
System Settings

1 Data Source
2 Control Settings
3 Set Historical ET
      1    2    3    Back
```

6
```
Control Settings

1 Effective Rain
2 ET Settings
3 Options
      1    2    3    Back
```
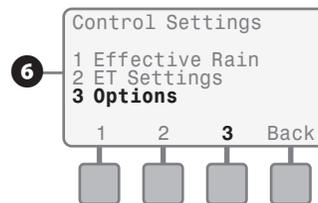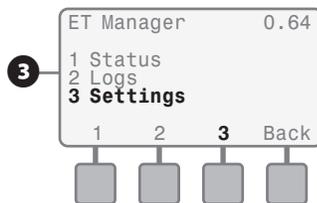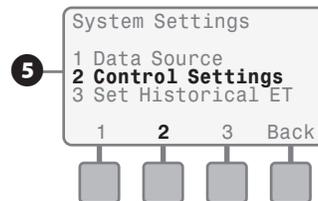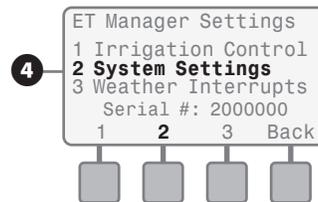
7 Press **2** Signal Kc.

8 Use the **+ or -** buttons to change the setting toggles between Use and Ignore. Press **Back** until Moisture Levels screen appears, or turn dial to Auto for 2 seconds, then back to ET MANAGER / IQ SETTINGS.

7
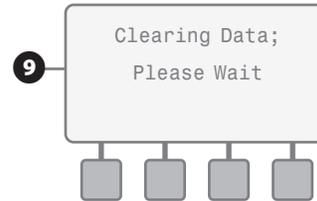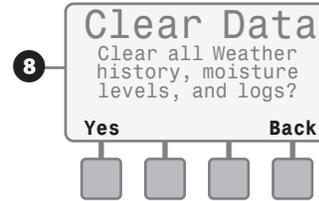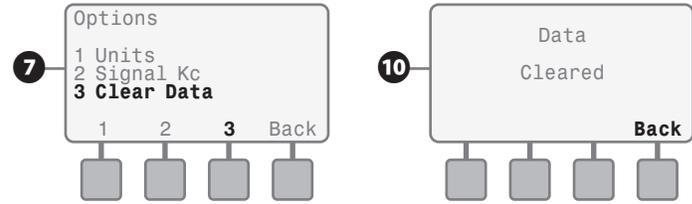
```
Options

1 Units
2 Signal Kc
3 Clear Data

  1     2     3    Back
```

8

```
Signal Kc

        Use
   Kc=Crop Coefficient
   +     —          Back
```

Wind Adjust

The wind speed measurement included in the weather signal can be scaled by a percentage to compensate for variations in prevailing conditions. When this setting is at 100%, the ET Manager Cartridge will use the exact wind measurement as it is received in the hourly weather broadcast. The default setting is 100%.

1 Turn the dial to ET MANAGER / IQ SETTINGS (older versions COMMUNICATIONS), Press **Ok** thru any Alert messages.

2 Press **Menu**.

3 Press **3** Settings.

4 Press **2** System Settings.

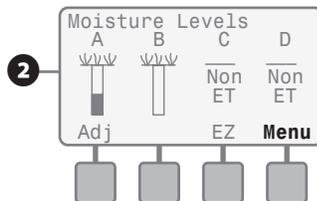**5** Press **2** Control Settings.

6 Press **2** ET Settings.

1
```
            Alert
       1 Hour Rain Cancel
             0.00"
                        Ok
```

2
```
Moisture Levels
   A     B    C     D
  ⋎⋎⋎   ⋎⋎⋎   __    __
              Non   Non
              ET    ET
 Adj        EZ    Menu
```

3
```
ET Manager      0.64
1 Status
2 Logs
3 Settings
     1    2    3   Back
```

4
```
ET Manager Settings
1 Irrigation Control
2 System Settings
3 Weather Interrupts
   Serial #: 2000000
     1    2    3   Back
```

5
```
System Settings
1 Data Source
2 Control Settings
3 Set Historical ET
     1    2    3   Back
```

6
```
Control Settings
1 Effective Rain
2 ET Settings
3 Options
     1    2    3   Back
```

7 Press **1** ET Source.

8 Use the **+ or -** buttons to change the setting toggles between Signal and Historical. Press **Back** until Moisture Levels screen appears, or turn dial to Auto for 2 seconds, then back to ET MANAGER / IQ SETTINGS.
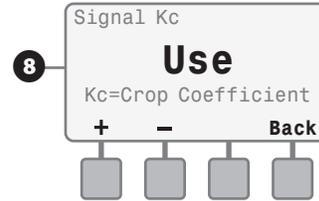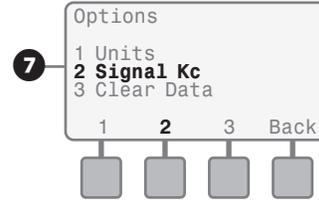
```
ET Settings

1 ET Source
2 Elevation
3 Wind Adjustment

   1      2      3     Back
```
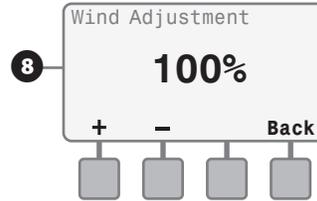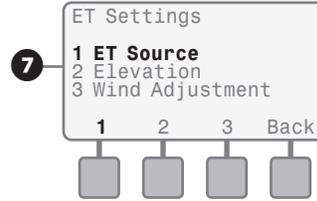
7

```
Wind Adjustment

        100%


   +      —            Back
```

8
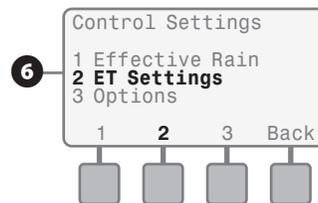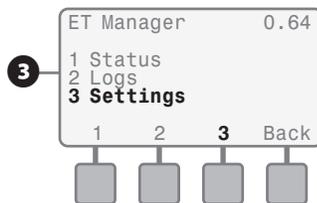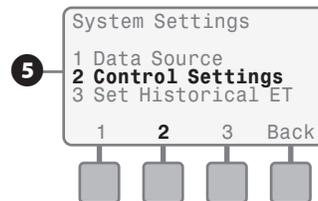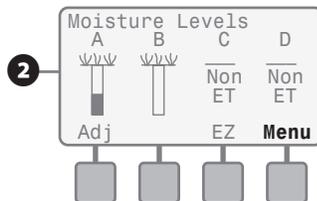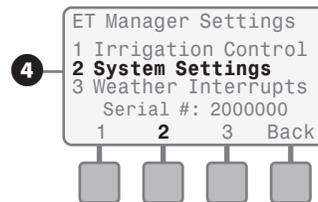
Troubleshooting

Alert Conditions and How To Respond

There are certain situations which could cause an Alert Condition. The following is a list of all possible Alert Conditions which could be displayed, what they mean and what action (if any) may need to be taken.

Symptom	Probable Cause	Action
No Signal Service Activation Required Please Contact Signal Provider	Your Weather Reach Signal Provider (WRSP) can send a "No Signal Service" signal to cancel weather signal reception. Typically this would happen only if the terms of the service agreement were not met. Subscription based weather signal service requires device activation by the Weather Reach Signal Provider.	Contact your Weather Reach Signal Provider to establish services.
Temperature Interrupt	If the hourly weather signal contains air temperatures that reach or are below the Temperature Interrupt setting, watering is canceled. Once the air temperature rises above the programmed interrupt setting, as received in the hourly weather signal, the Temperature Cancel will clear.	none.
Wind Interrupt	If the hourly weather signal contains wind speeds that reach or exceed the Wind Interrupt setting, watering is canceled. Once the wind speed decreases below the programmed interrupt setting, as received in the hourly weather signal, the Wind Cancel will clear.	none.
24 Hour Rain Interrupt	If rainfall over the last 24 hours is at or above the Rain Cancel setting, watering is canceled. Once the total rainfall in the last 24 hours drops below the Rain Cancel setting, the 24 Hour Rain Cancel will clear.	none.
1 Hour Rain Interrupt	If rainfall over the last hour is at or above the 1 Hour Rain setting, watering is canceled. Once the total rainfall in the last hour drops below the 1 Hour Rain setting, the 1 Hour Rain Cancel will clear.	none.
Provider Interrupt	The Weather Reach Signal Provider (WRSP) can send a signal to interrupt watering. This may be necessary during an emergency condition in the community requiring watering to be suspended to limit the demand on the community water system. As a service, your WRSP may also watch weather forecasts and choose to interrupt watering for expected conditions such as large rain storms. A Provider Interrupt lasts for 24 hours. For information regarding a current Provider Interrupt, contact your Weather Reach Signal Provider.	none.

Symptom	Probable Cause	Action
No Weather Signals have been received in the last 24 Hours	If the ET Manager Cartridge does not receive weather data for 24 hours, this message will be displayed. There are 5 reasons the weather signal would not be received for 24 hours: 1. The Signal Provider Code has not been set correctly. 2. The weather region number has not been set correctly. 3. Weak radio reception has caused the ET Manager Cartridge to miss 24 hours of messages. 4. Signal service has been canceled by the Weather Reach Signal Provider. 5. The Signal Provider is having technical difficulties.	Verify that the Signal Provider Code and weather region have been programmed correctly. Turn the dial to the ET MANAGER/IQ SETTINGS position, from the Moisture Levels screen, press the Alrt button to check for other Alert Messages. Either the "No Signal Service Activation Required Please Contact Signal Provider" or "Low Weather Signal Accuracy" message will be displayed, refer to trouble shooting for applicable alert message. Contact the Signal Provider if you believe they are having technical difficulties. NOTE: All missed messages are replaced with a calculated ET value based on previously received weather information and the historical ET programmed in your ET Manager.
No Paging Signal Detected	The ET Manager Cartridge verifies the presence of the Paging Signal every minute. If the paging signal is not detected after a period of time, this message will be displayed. There are 3 reasons the weather signal would not be detected; 1. The radio needs to be reset. 2. The Signal Provider Code has not been set correctly. 3. Weak radio reception.	If this Alert Condition occurs, wait two minutes to ensure the weather signal will not be detected within the next few minutes. If the Alert Condition remains, follow these steps: 1. Follow the steps on page 15 to Test the Weather Signal. 2. Press More, then Reset, then Back. 3. Wait two minutes, if the Signal changes from "Not Detected" to "Detected," your paging signal has been restored. 4. Verify the Signal Provider Code is programmed correctly. If the Signal Provider Code is programmed correctly and the Alert Condition remains, an external mounting kit may be needed to improve radio reception. Contact Rain Bird to find out more information about an optional Remote Mounting Kit (ETM-RMK)

Symptom	Probable Cause	Action
Low Weather Signal Accuracy	If data reception accuracy is less than 50% then the Low Weather Signal Accuracy message is displayed. There are 2 reasons the Weather Signal Accuracy may be low: 1. Weak radio reception. 2. Signal service has been canceled by the Weather Reach Signal Provider.	Weak radio reception or radio interference may cause missed weather signals. An external mounting kit may be needed to improve radio reception. Contact Rain Bird to find out more information about an optional external mounting kit. It may be that your WRSP had system problems that interrupted the weather signal for a period of time. If data continues to be missed for several days, contact your WRSP, to check if there has been interruption in the weather signal. NOTE: All missed messages are replaced with a calculated ET value based on previously received weather information and the historical ET programmed in your ET Manager.
Local Rain Gauge Input Failure Check Wiring	If you are using a rain gauge to collect rain data and this message is displayed, there is a problem with the input to the Rain Tip wire terminal.	Verify the on-site rain gauge is installed and wired properly. Check the length of the rain gauge wire for cuts or nicks, replace damaged wire. Check the rain gauge for damage.
Historical ET is NOT set	The ET Manager Cartridge uses historical ET values set by the user as a backup in the event weather signal service is not available. If no Historical ET has been programmed, this message is displayed.	Monthly historical ET values for your area are available from the Historical ET database included in the ET Manager Cartridge Resource CD. Look up your city and state, then program the monthly values into the ET Manager Cartridge, see page 17.
Signal Provider Code is NOT set	If this message appears, your ET Manager Cartridge has been installed but not programmed with a Signal Provider Code.	Navigate the menus to the Signal Provider Code and program the appropriate Signal Provider Code see page 17. To obtain your Signal Provider Code, contact your Rain Bird Distributor, your installation contractor, or go to www.rainbird.com/wrsp.
PGM X is at Wilting Point	The ET Manager Cartridge computes the current Moisture Levels for each Program. If conditions cause the Moisture Level for a program to dry out to the negative Total Irrigation amount, this is considered Wilting Point and the Alert message is displayed.	Review the days available for watering and add additional days if possible. Or change the Irrigation amount to a higher value.

Symptom	Probable Cause	Action
Radio Initialization Failure Press ET Manager Cartridge Reset	Your ET Manager Cartridge uses a radio to receive the weather signal. If the ET Manager Cartridge is experiencing radio initialization problems, this message will appear.	The radio may need to be re-initialized. To do so, press the Reset button on the ET Manager Cartridge. If the problem persists, the ET Manager Receiver must be replaced.
Radio Failure	Your ET Manager Cartridge uses a radio to receive the weather signal. If the ET Manager Cartridge has detected a radio failure, this message will appear.	The radio may need to be re-initialized. To do so, press the Reset button on the ET Manager Cartridge. If the problem persists, the ET Manager Receiver must be replaced.

Landscape Conditions and How to Respond

Symptom	Probable Cause	Action
Dry or Wet Spots in Landscape	Dry and wet spots are often caused by inefficiency in the distribution of water by your sprinkler system.	1. Check the sprinkler heads near the spot that is dry or wet. It is possible that a broken or clogged head or nozzle needs to be replaced. 2. Check the layout of your sprinkler design. Proper sprinkler designs should ensure head to head coverage. Changing a nozzle size, adding or moving a head may improve water distribution. 3. If steps 1 and 2 do not solve the problem, check the run times in the LXM adding additional time for the station where the spot appears may compensate for minor sprinkler system inefficiencies. NOTE: Manual watering to the spot will speed recovery. Adjust the run time using small intervals of time, 1 or 2 minutes. Monitor the spot after an adjustment has been made. This will help determine what run time is optimal to prevent dry or wet spots.

Symptom	Probable Cause	Action
Entire station or zone is too dry or wet	Stations or zones are the distinct areas in your landscape watered by one valve. Dry or wet stations or zones are often caused by a run time problem programmed in the LXM.	1. Start the zone to confirm that the zone is operating properly. 2. Check the run time on your LXM for the station. The dry or wet station can be caused by too little or too much watering. 3. Manually water the station if it is too dry to get it the water it needs. 4. Adjust the run time using small intervals of time, 1 or 2 minutes. This will help determine what run time is optimal to prevent dry or wet stations.

Several stations in a Program are too dry or too wet	There are two possible causes for all the stations in a Program being to dry or too wet:
	
	    1. A run time problem programmed in your sprinkler controller.
	
	    2. The Irrigation Amounts were not correctly programmed
		1. If the Program is too dry, manually water the Program to get it the water it needs.
		
		2. Check the run times on your LXM. The dry or wet Program can be caused by too little or too much run time for each station.
		
		3. Adjust the run time(s) using small intervals of time. This will help determine what run time is optimal to prevent dry or wet stations.
		
		4. If steps 1 and 2 do not fix this problem, adjust the Irrigation Amount for the Program. See Appendix , Determining the Irrigation Amount, for more information on this setting.
		
		NOTE: You want to increase your Irrigation Amount if you are experiencing a wet Program and you want to decrease your Irrigation Amount if you have a dry Program.

Symptom	Probable Cause	Action
The site is watering every day	There are three possible causes of why the site is watering everyday: 1. The Irrigation Amount(s) are programmed too low. 2. The Minimum Run Time Limit is programmed too low. 3. ET rates are high enough that daily watering is necessary (no action is required)	1. The Irrigation Amounts could be programmed too low. The total Irrigation Amount should be equal to or above peak historical ET values. See Appendix Determining the Irrigation Amount for more information about this setting. 2. The Minimum Run Time Limit lets you decide the smallest percentage of the watering cycle you will allow to run. Setting the Minimum Run Time Limit to 0% means that with each amount of ET received the ET Manager Cartridge will try to replace the water immediately even if it means running the Programs for only 1% of their scheduled time. Adjust the Minimum Run Time up (default setting is 80%).
I want to water on the next cycle	There may be occasions when, in your judgment, the sprinklers should water the next watering cycle.	To water the next cycle you may manually start the Program(s), or adjust the Moisture Levels for the selected program(s) to 0.
After a rainstorm my sprinkler system resumes watering too soon	There are several reasons the sprinkler system resumes watering too soon after a rainstorm: 1. The rainfall received in the weather signal may not correctly represent rainfall at your site. 2. Location of your optional on-site rain gauge may be poorly sited. 3. The rain source in the ET Manager Cartridge may be programmed incorrectly. 4. Effective Rain settings may need to be adjusted.	1. The weather signal rainfall value may not correctly represent rainfall at your site. Connect an optional on-site rain gauge (ETM-RG). 2. Check the location of your optional on-site rain gauge, make certain there are no obstacles blocking rain from entering the rain gauge. 3. Check the rain source to verify the ET Manager Cartridge is programmed to use data from the correct rain source (see page 19). 4. The Maximum Hourly Rain setting may be limiting the amount of rainfall applied to the Moisture Levels. Change the Maximum Rain to a higher amount to accept more rainfall in the Moisture Levels 5. The Saturation Allowance may be too low. Change the Saturation Allowance to a higher amount to accept more rainfall in the Moisture Level(s).

Symptom	Probable Cause	Action
After a rainstorm my sprinkler system does not resume watering soon enough	There are several reasons the sprinkler system may not resume watering soon enough after a rainstorm: 1. The rainfall received in the weather signal may not correctly represent rainfall at your site. 2. The rain source in the ET Manager Cartridge may be programmed incorrectly. 3. Effective Rain settings may need to be adjusted.	1. The weather signal rainfall value may not correctly represent rainfall at your site. Connect an optional on-site rain gauge. 2. Check the rain source to verify the ET Manager Cartridge is programmed to use data from the correct rain source. 3. The Maximum Hourly Rain setting may be accepting more rainfall into the Moisture Levels than the landscape is actually capable of accepting. Change the Maximum Rain to a lower amount to limit rainfall in the Moisture Levels. 4. The Saturation Allowance may be too high. The Saturation Allowance creates a limit to the amount of rain that can accumulate in the Moisture Level(s). Change the Saturation Allowance to a lower amount to limit the amount of rainfall that can accumulate in the Moisture Level(s).
It was raining and the sprinklers were running	There are several reasons the sprinkler system may be watering during a rainstorm: 1. The rainfall received in the weather signal may not correctly represent rainfall at your site. 2. The rain source in the ET Manager Cartridge may be programmed incorrectly. 3. Rain cancel settings may need to be programmed.	1. The weather signal rainfall value may not correctly represent rainfall at your site. Connect an optional on-site rain gauge. 2. Check the Weather Info for the last hour of rain to verify the rain data is being reported by your ET Manager Cartridge. 3. Check the rain source to verify the ET Manager Cartridge is programmed to use data from the correct rain source, if correct check the rain gauge for proper functionality (you may need to contact your Weather Reach Signal Provider). 4. Program a 1 Hour Rain Cancel to stop watering until rain accumulations reach below the programmed Rain 1 Hour setting. 5. Program a Rain Cancel to cancel watering until rain accumulations reach below the programmed Rain Cancel setting.

Glossary

If rainfall over the last hour is at or above the 1 Hour Rain Interrupt setting, watering is canceled. Once the total rainfall in the last hour drops below the 1 Hour Rain Interrupt setting, the 1 Hour Rain Interrupt will clear.

If rainfall over the last 24 hours is at or above the 24 Hour Rain Interrupt setting, watering is canceled. Once the total rainfall in the last 24 hours drops below the 24 Hour Rain Interrupt setting, the 24 Hour Rain Interrupt will clear.

The ET Manager Cartridge looks at the last two weeks of weather signals and reports the accuracy of the weather signal. An accuracy level less than 50% will create and Alert Condition.

If it becomes necessary, you may clear all records stored in the ET Manager Cartridge. Clearing Data will not change and settings, but will erase all weather information, paging history, interrupt history, and irrigation logs, and will automatically set your Moisture Levels to 0.

The All Pages counter registers every signal received, the Weather Region counter registers every signal received on the programmed Weather Region, the Rain Region counter registers every signal received on the programmed Rain Region (if applicable), the Local Rain Tips registers every tip received.

Effective rain is the amount of rain that is an available source of water for the plant. When rainfall amounts and intensities are extreme, not all rainfall will stay within the root zone. To restrict the amount of rain recognized by the system, two effective rainfall limits should be programmed: Max Hourly Rain and Saturation Allowance.

In order to calculate accurate ET for your location, your approximate elevation is necessary. To determine your elevation you may refer to the elevation of the nearest weather station, such information is available on the Signal Provider Information Sheet and on the Resource CD.

An abbreviation for evapotranspiration which is a measurement of water that evaporates from the soil and transpires from a plant. ET represents the total moisture loss from the root zone.

The ET Manager Programming Software is a software program that simplifies ET Manager programming. The ETM-PS allows you to connect your ET Manager Receiver to a personal computer to perform several key functions.

The Rain Bird ET Manager Scheduler software program uses sprinkler system capabilities and site specific information to help you prepare a watering schedule and determine ET Manager Cartridge settings.

The ET Manager can be set to operate using either the hourly weather signal, or historical ET data.

This setting represents an average daily ET for each month. If a problem occurs and the ET Manager Cartridge is not receiving the weather signal, it will continue to operate using historical ET settings as default ET. See your ET Manager Cartridge Resource CD for a database of Historical ET data for your area.

The ET Manager Cartridge uses historical ET values set by the user as a backup in the event weather signal service is not available. If no Historical ET has been programmed, this Alert message is displayed.

The amount of water in inches (or mm) applied to the landscape during each program start. The Total Irrigation Amount is calculated by multiplying the number of program starts by the Irrigation Amount. Use the ET Manager Cartridge Resource CD to determine your Irrigation Amount based on information about your sprinkler system and landscape.

The Landscape Adjustment Percentage is used to adjust for site-specific landscape needs for each Program. The Landscape Adjustment Percentage is applied to the calculated ET, and affects the adjustment of current Moisture Levels for each Program. As a general rule the Landscape Adjustment Percentages should range between 60% - 100% for turf grass and 40% - 80% for shrubs.

If you are using a rain gauge to collect rain data and there is a problem with the input to the Rain Tip wire terminal, this message is displayed.

If water days are limited the ET Manager Cartridge looks ahead each day to determine if watering should occur even though the Moisture Level has not met minimum levels.

If data reception accuracy is less than 50% then the Low Weather Signal Accuracy message is displayed.

The Maximum Hourly Rain is the maximum amount of rain that will be used in an hour to adjust the soil moisture level.

The Maximum Run Time gives you the ability to decide the largest percentage of your watering cycle you will allow to be applied to your landscape. There may be instances where watering has been turned off and the Moisture Level in your landscape has dried out more than a regular watering cycle will be able to replace. In this situation the ET Manager Cartridge will adjust the Seasonal Adjust percentage above 100% causing your sprinklers to run longer than their normally scheduled time. The Maximum Run Time may be helpful if there is a certain amount of time you want your watering to stay within.

The Minimum Run Time gives you the ability to decide the smallest percentage of your watering cycle you will allow to be applied to your landscape. For example, if you set the Minimum Run Time to 50%, then the ET Manager Cartridge will not allow watering until enough Moisture has been lost from the soil to run the Program(s) for half their normally scheduled time. Setting this percentage to a low number will mean that your ET Manager Cartridge will allow watering even if only a small amount of evaporation has occurred. Setting this percentage to a high number will delay watering until more evaporation has occurred, providing oxygen to the roots which will encourage them to grow deeper, without sacrificing the health of the plant.

The moisture level represents the current amount of moisture in your soil and is constantly changing due to evaporation (ET), rain, and irrigation. The ET Manager Cartridge uses the Moisture Level to determine the Season Adjust percentage set in the controller by the ET Manager Cartridge.

The ET Manager Cartridge periodically verifies the presence of the Paging Signal. If the paging signal is not detected after a period of time, this message will be displayed.

No Signal Service Activation Required Please Contact Signal Provider 55

Your Weather Reach Signal Provider (WRSP) can send a "No Signal Service" signal to cancel weather signal reception. Typically this would happen only if the terms of the service agreement were not met. Subscription based weather signal service requires device activation by the Weather Reach Signal Provider.

No Weather Signals have been received in the last 24 Hours 56

 If the ET Manager Cartridge does not receive weather data for 24 hours average this message will be displayed.

PGM X is at Wilting Point 57

The ET Manager Cartridge computes the current Moisture Levels for each Program. If conditions cause the Moisture Level for a program to dry out to the negative Total Irrigation amount, this is considered Wilting Point and an Alert message is displayed.

Precipitation Rate 69

The rate at which water is applied to the landscape, or the precipitation rate, is measured in inches per hour.

Provider Interrupt 55

The Weather Reach Signal Provider (WRSP) can send a signal to interrupt watering. This may be necessary during an emergency condition in the community requiring watering to be suspended to limit the demand on the community water system. As a service, your WRSP may also watch weather forecasts and choose to interrupt watering for expected conditions such as large rain storms. A Provider Interrupt lasts for 24 hours. For information regarding a current Provider Interrupt, contact your Weather Reach Signal Provider.

Radio Initialization Failure Press ET Manager Cartridge Reset 58

The ET Manager Cartridge uses a radio to receive the weather signal. If the ET Manager Cartridge is experiencing radio initialization problems, this message will appear.

Radio Failure 58

The ET Manager Cartridge uses a radio to receive the weather signal. If the ET Manager Cartridge has detected a radio failure, this message will appear.

Like the weather region number, a rain region number represents a rain gauge accessed by the Weather Reach Signal Provider who then broadcasts the rain region data. The user programs the rain region number to correspond to a rain region that closely represents rainfall for the location of the ET Manager Cartridge. To determine if a Rain Region is available in your area, refer to the Signal Provider Information Sheet for your signal provider.

The rain source is the source of rain data for the ET Manager Cartridge. Rain data can come from 1) the hourly weather signal, 2) optional on-site rain gauge (either 1 mm / tip or .01" / tip), 3) rain region.

The amount or rain it takes to saturate the soil after satisfying the total irrigation amount before run-off occurs. Unique Saturation Allowance settings can be made for each program and are typically programmed as half the total irrigation amount.

The serial number of your ET Manager Cartridge can be found on the ET Manager Receiver Cable, and is also displayed at the bottom of the ET Manager Settings screen.

Signal Kc (or Signal Crop Coefficient) is used by the Weather Reach Signal Provider to modify ET to a specific crop and can change over the year due to seasonal conditions. You can choose to "Use" or "Ignore" this adjustment. For information on the signal crop coefficient, contact your Weather Reach Signal Provider.

The ET Manager Cartridge must be programmed to receive information from your local Weather Reach Signal Provider (WRSP). A Signal Provider Code is unique for each WRSP and is necessary for an ET Manager Cartridge to receive a weather signal. The code consists of 10 different numbers labeled A thru J. For a map of available WRSP and their Signal Provider Codes visit www.rainbird.com/wrsp.

If the ET Manager Cartridge has been installed but not programmed with a Signal Provider Code, this Alert message appears.

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Appendix

Determining the Irrigation Amount

Irrigation Amount Setting

There are several ways to determine the Irrigation Amount setting:

1. Use the ET Manager Scheduler software found on the ET Manager Cartridge resource CD to determine all settings for your ET Manager Cartridge and LXM controller. The scheduler software requires site information such as: root depth, soil type, and sprinkler type, nozzle, pressure, and spacing information to calculate the precipitation rate of each zone. Catch can collections can also be entered into the scheduling software to calculate you precipitation rate and distribution uniformity.

2. Use the sprinkler head manufacturer's expected precipitation rate (typically expressed in inches per hour). Perform this calculation for each zone to determine the setting for each Program:

$$\text{Precip. Rate} \quad \textbf{X} \quad \begin{array}{c}\text{System}\\\text{Efficiency}\\\text{(80\%=0.8)}\end{array} \quad \textbf{X} \quad \begin{array}{c}\text{Run}\\\text{Time}\\\text{(min).}\end{array} \quad \div \quad 60 \quad = \quad \begin{array}{c}\text{Irrigation}\\\text{Amount}\end{array}$$

3. Perform a Catch Can Test for each valve. A Catch Can Test is done by placing "cans" with sides that are straight up and down in various locations throughout the zone, then run the zone for the entire scheduled run time. Measure the amount of water in each "can" and average the amounts. This average measurement is your Irrigation Amount.

ET Manager Cartridge Default Settings

Irrigation Control

    Irrigation Amount:

        PGM A: NON-ET

        PGM B: NON-ET

        PGM C: NON-ET

        PGM D: NON-ET

    Landscape Adjustment %

        PGM A: 100%

        PGM B: 100%

        PGM C: 100%

        PGM D: 100%

    Run Time Limits

        Minimum Run Time: 80%   Maximum Run Time: 120%

System Settings

    Weather Region: 1

    Rain Source: Signal

        Local Gauge: ETM-RG

        Rain Region: 1

Signal Provider Code (A-J): 0

Effective Rain

    Max Hourly Rain: 0.25"

    Saturation Allowance:

        PGM A: 0.10"

        PGM B: 0.10"

        PGM C: 0.10"

        PGM D: 0.10"

ET Source: Signal

Elevation: 1000"

Wind Adjust: 100%

Units: English

Signal Kc: Use

Historical ET (Jan – Dec): 0"

Weather Interrupts

    Rain 1 Hr: 0.15"   Temperature: 32°F

    Rain 24 Hr 0.30"   Wind: 20 mph

Moisture Level Example

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12
ET	0.18	0.12	0.16	0.16	0.15	0.24	0.24	0.24	0.17	0.22	0.17	0.20
Rain				0.28	1.28							
Irrigation		0.45						0.50			0.56	
Season Adjust %	0%	89%	0%	0%	0%	0%	0%	100%	0%	0%	112%	0%

Moisture Level 0.75"

SATURATION ALLOWANCE SETTING 0.25"

Moisture Level 0.50"

TOTAL IRRIGATION AMOUNT SETTING 0.50"

Moisture Level 0.00"

NEGATIVE TOTAL IRRIGATION AMOUNT

Moisture Level -0.50"

Irrigate

Rain

Irrigate

Irrigate

Rain Bird Support

Rain Bird ET Manager Hotline

(5:00 a.m. to 5:00 p.m. Pacific time)

1-877-351-6588 (U.S. and Canada only)

Rain Bird Technical Services Hotline

(5:00 a.m. to 5:00 p.m. Pacific time)

(800) 247-3782 (800-BIRD-SVC) (U.S. and Canada only)

Rain Bird Specifications Hotline

(800) 458-3005 (U.S. and Canada only)

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Visit us at www.rainbird.com

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If the equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by Rain Bird Sales, Inc., could void the user's authority to operate the equipment.

This product was FCC certified under test conditions that included the use of shielded I/O cables and connectors between system components. To be in compliance with FCC regulations, the user must use shielded cables and connectors and install them properly.

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