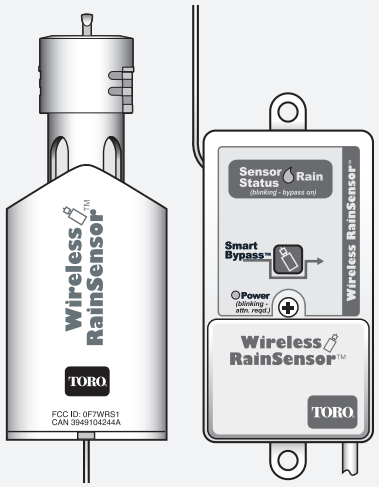
TORO Count on it.

Wireless RainSensor™ Model 53770
Installation and Operating Guide



Sensor Module **Receiver Module**

Introduction

Adding a Toro Wireless RainSensor to your automatic sprinkler system is an easy, effective means of conserving water and lowering your monthly water bill while promoting a healthier lawn and garden.

The RainSensor system consists of a receiver module that installs next to your sprinkler timer, either indoors or out, and is connected to the timer's 24 VAC power supply and sensor wire terminals (if equipped) or the valve common wire circuit. The sensor module attaches to a rain gutter, roof eaves or other suitable location where the sensor is exposed to all weather conditions and is within the receiver's signal reception range.

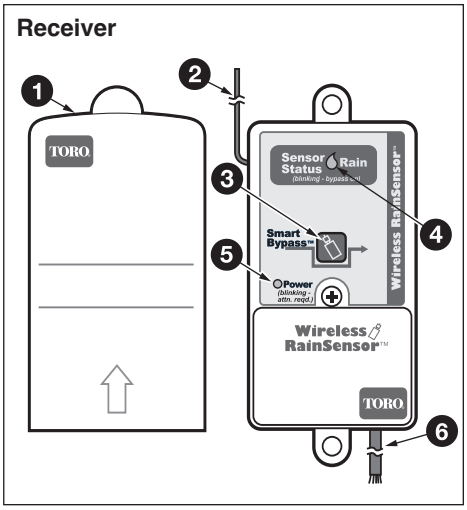
The Wireless RainSensor is designed for easy installation and convenient operation. For a quick overview of the installation process, take a few moments to read through the instructions and have your sprinkler timer user's guide on hand for additional reference.

⚠ Important

- **The receiver module operates on 24 VAC. Connecting to 110 VAC or higher voltage will result in severe equipment damage.**
- Installation of this equipment must comply with all applicable building codes for the area. If necessary, contact a qualified contractor for assistance.
- The sensor module must **never** be installed inside a rain gutter, rain collection vessel or in any location where submersion is possible.
- If the receiver module is installed outdoors, it's cover must be in the closed position to provide weather resistance and protection.

RainSensor System Features

Receiver Features



1- Cover

Slide cover upward to remove. Keep the cover in place to protect receiver when installed outdoors.

2- Antenna wire

Position straight up for optimum signal reception.

3- Smart Bypass™ Button

Press to temporarily override the RainSensor system (when activated by rain) allowing automatic watering to resume. Press again to return to sensor-controlled operation.

Press and hold to turn off the receiver.

4- Sensor Status Indicator

Indicator is on when the RainSensor system is active and automatic watering on hold.

Indicator flashes when the RainSensor system is in the bypass mode.

5- Power Indicator

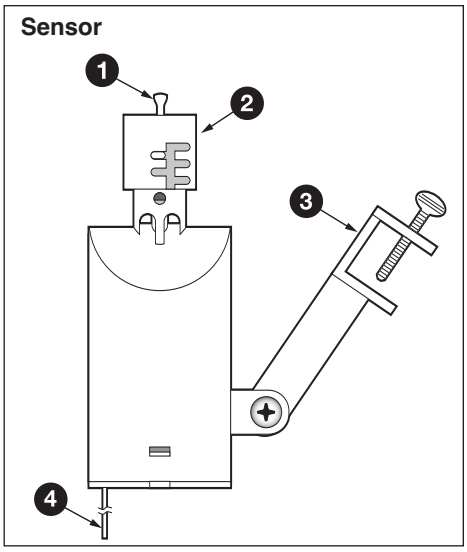
Indicator is on when the receiver has 24 VAC power applied.

Indicator flashes when RainSensor system attention is required due to low sensor battery power or signal reception problem.

6- Wire Cable

Weather-resistant cable with color-coded wires for ease of installation.

Sensor Features



1- Test Spindle

Press down and hold to manually test RainSensor operation.

2- Rainfall Adjustment Cap

Adjusts sensor activation point to approximately ⅛, ¼, ½, ¾ or 1" of accumulated rainfall.

3- Quick-Clip™ Mounting Bracket

Enables the sensor to be easily installed and vertically adjusted to compensate for an angled mounting surface.

4- Antenna Wire

Positioned straight down for maximum signal range.

Quick-start Installation Procedure

Note: The following installation procedure is provided for the experienced installer. For detailed installation procedures and wiring diagrams, continue on page 4.

1. Disconnect power to the sprinkler timer.
2. Route the receiver cable to the timer's wire connection terminal block.
3. Fasten the receiver next to the timer using the provided stainless steel screws for exterior or rough surfaces, or the double-sided tape for smooth interior surfaces.
4. Use procedure **A** if the timer **is** equipped for rain sensor connection.

   Note: Refer to the timer user's guide to determine if a normally-open (NO) or normally-closed (NC) sensor is required.

   Use procedure **B** if the timer **is not** equipped for rain sensor connection.

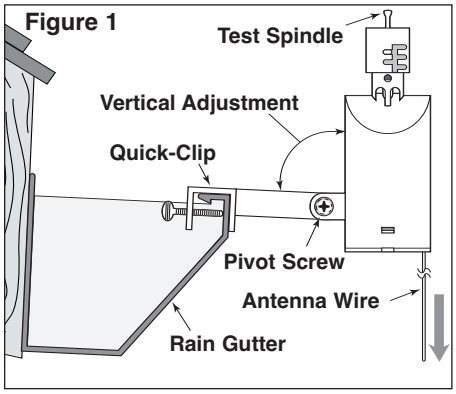
   A. Remove the jumper wire (if installed) from the sensor terminals. Connect the **White** wire to either sensor terminal.
   - For a **normally-open** (NO) sensor circuit, connect the **Yellow** wire to the remaining sensor terminal. Tape back or cut off the Brown wire.
   - For a **normally-closed** (NC) sensor circuit, connect the **Brown** wire to the remaining sensor terminal. Tape back or cut off the Yellow wire.

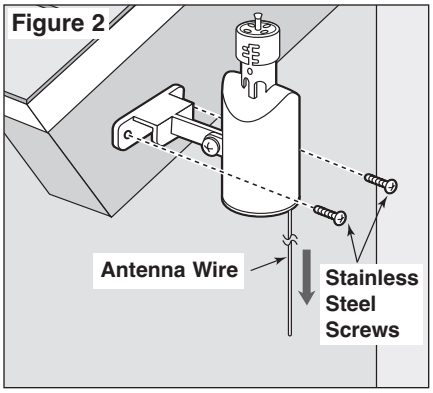
   B. Disconnect the valve common wire and optional pump start relay or master valve common wire (if installed.)

   Using a twist-on wire connector, splice the **Brown** wire to the common wire(s). Connect the **White** wire to the valve common terminal.
5. Connect the two **Red** wires to the timer's 24 VAC power supply terminals.
6. Apply power to the timer.

   Note: The receiver's Power indicator should turn on. If the Power indicator is not on, check the **Red** wire connections before continuing.
7. Straighten both antenna wires. Holding the sensor near the receiver, press and hold the sensor Test Spindle for 15–20 seconds. The Sensor Status indicator should turn on indicating that communication is established.

   Note: If the indicator does not turn on, check all wire connections and refer to "Resetting the Signal Code (page 8) for a possible solution. Communication between the sensor and receiver **must** be confirmed before continuing.
8. Install the sensor in an unobstructed location, protected from sprinkler spray. Refer to the suggested installation methods shown in Figures 1 and 2 below.





Detailed Installation Instructions

Receiver Installation

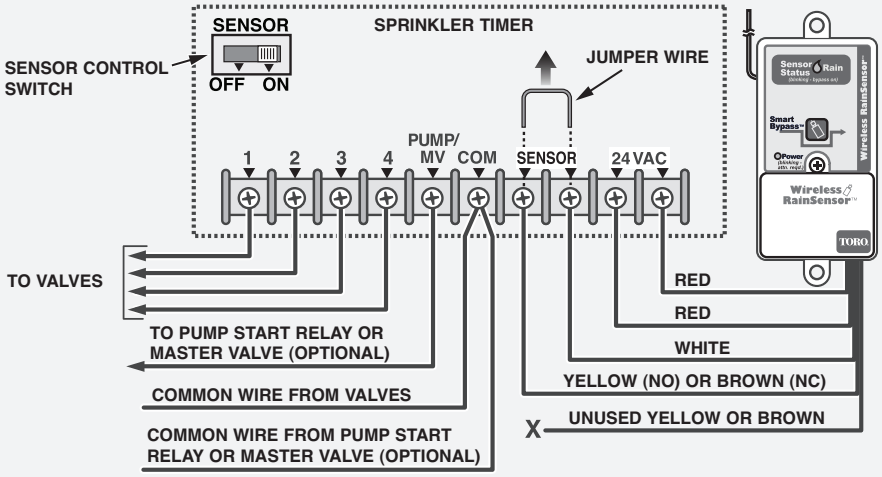
1. Disconnect power to the sprinkler timer.
2. Route the receiver cable to the timer's wire connection terminal block.
3. Fasten the receiver next to the timer using the provided stainless steel screws for exterior or rough surfaces, or the double-sided tape for smooth interior surfaces.

Note: Use installation **Procedure A** if the timer **is** equipped with sensor connection terminals.

Use installation **Procedure B** if the timer **is not** equipped with sensor connection terminals.

Note: The following diagrams are for illustrative purposes only. Refer to your sprinkler timer user's guide for specific sensor connection information.

Procedure A – Sprinkler Timer Equipped for Sensor Connection



Note: The RainSensor receiver can be connected for normally-open (NO) or normally-closed (NC) sensor circuits. Toro sprinkler timers, such as ECx® and GreenKeeper®, have a normally-open rain sensor circuit. The ECXTRA timer features a control switch to select either type of circuit. Refer to your timer user's guide for specific sensor installation and operating information.

Note: If a jumper wire is installed to the sensor terminals, loosen the terminals and remove the jumper wire at this time.

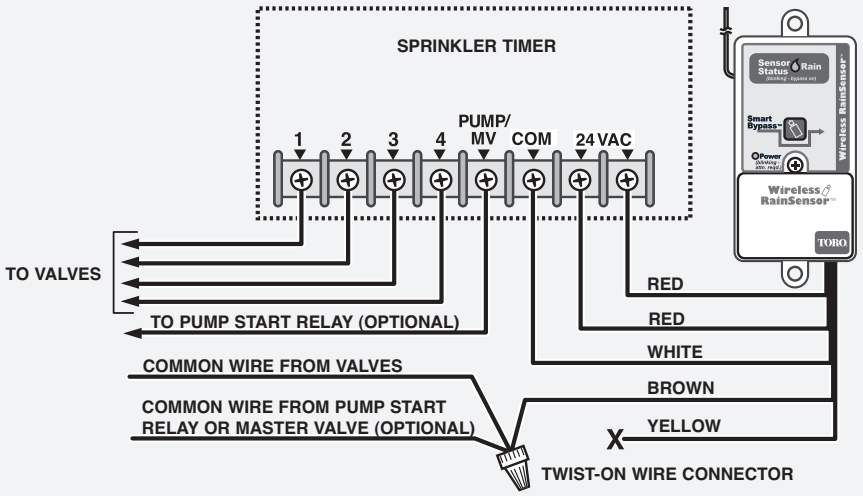
- For a **normally-open (NO)** sensor, connect the **Yellow** wire to either sensor terminal. Tape back or cut off the Brown wire.
- For a **normally-closed (NC)** sensor, connect the **Brown** wire to either sensor terminal. Tape back or cut off the Yellow wire.

Connect the **White** wire to the remaining sensor terminal.

Connect the **Red** wires to the timer's 24 VAC power supply terminals.

Note: If your timer has a Sensor switch, make sure the switch is in the "On" or "Active" position to enable sensor-controlled operation.

Procedure B – Sprinkler Timer Not Equipped for Sensor Connection



Remove the valve and (optional) pump start relay common wire(s) from the valve common terminal(s), generally labeled COM, or C.

Note: Your sprinkler system may utilize an automatic pump start relay or a master valve that is connected to the timer with a separate common wire. Be sure to include all of the common wires in the receiver connection.

Splice the **Brown** wire to the common wire(s) using a twist-on wire connector. Tape back or cut off the Yellow wire.

Connect the **White** wire to the common terminal.

Connect the **Red** wires to the timer's 24 VAC power supply terminals.

Initial RainSensor System Test

1. Apply power to the timer.

   Note: The receiver's Power indicator should turn on. If not, check the **Red** wire connections. The Power indicator must be on before continuing.

2. Position the receiver antenna upward and the sensor antenna downward.
3. While holding the sensor near the receiver, press and hold the Test Spindle. The Sensor Status indicator should turn on. If it does not turn on, check all wire connections before continuing. Also see "Resetting the Signal Code" on page 8.

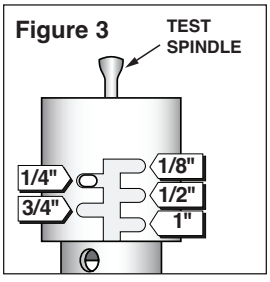
Rainfall Adjustment

The Rainfall Adjustment Cap enables the sensor activation point to be set for approximately ⅛, ¼, ½, ¾ or 1 inch of accumulated rainfall.

1. To select a setting, turn the cap from the current position and engage the stationary pins at the desired slot. See Figure 3.

⚠ **Important: The ⅛ inch adjustment setting should not be used in regions where fog or high humidity conditions are common.**

Figure 3



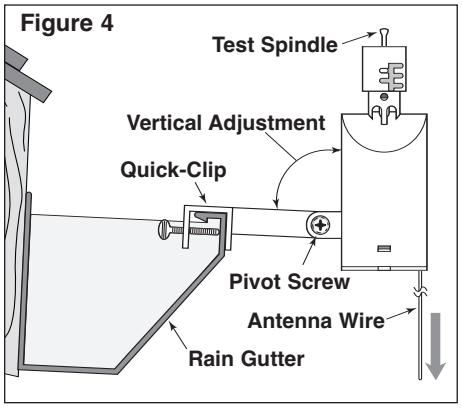
Sensor Installation

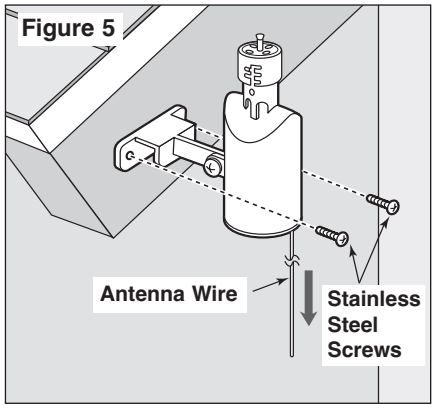
The outer edge of a rain gutter is generally a good location for the sensor module. Other recommended sites include roof eaves, a fence rail or garden tool shed.

For the best results, select a location for the sensor that provides:

- ☑ The minimum distance between the sensor and receiver
- ☑ Unobstructed exposure to rain, sun and wind (typical for your yard)
- ☑ Protection from spray and mist from the sprinklers and rainwater runoff

1. At the selected installation site, test the signal reception again. If the Sensor Status indicator does not turn on, refer to "About Radio Reception" on page 7.
2. Install the sensor module as indicated in Figure 4 or 5 below.





3. With the sensor module securely fastened, check for the correct vertical alignment. To adjust, loosen the pivot screw slightly, align the sensor to vertical and tighten screw to secure in position.

Sprinkler System Test

Performing this test is the final step to confirm that your Wireless RainSensor system and sprinkler timer are working together correctly.

First, turn on a sprinkler zone that is visible from the sensor location.

Note: The Manual operation of some sprinkler timers bypasses the sensor control feature. You may need to run an automatic watering program to perform this test. To do this, simply reset the automatic program start time to one or two minutes after the current time of day.

If your timer has a Sensor switch, make sure the switch is in the "On" or "Active" position to enable sensor-controlled operation.

With the sprinklers on, press and hold the sensor Test Spindle to activate the RainSensor system. The sprinklers should turn off within a short time, which confirms a successful installation. If the sprinklers do turn off, refer to "About Radio Reception" on page 7.

About Radio Reception

The sensor and receiver are capable of communicating up to 300 feet LOS (line of sight). “LOS” is an industry standard measurement that is used to determine the useful range of a radio signal when measured in an open field. However, in most installations there will be obstacles that can reduce the signal range. Building walls and floors will reduce the signal range to a varying degree depending on the type of construction material, design and overall thickness.

If you are having difficulty obtaining signal reception, use the checklist below to help resolve the problem. If radio communication cannot be established, contact a Toro Customer Support representative for further assistance at 1-800-367-8676.

- ☐ Make sure the antenna wires are straight and parallel to each other.
- ☐ If the sensor is located directly above the receiver, move it slightly to either side.
- ☐ Avoid installing either component where it’s antenna touches or is close to a large metal building or object.
- ☐ Try moving the sensor a few feet in either direction. (Sometimes just a small distance can greatly improve signal reception.)
- ☐ Avoid installing the receiver in an indoor location where a cell or cordless phone has reception problems.
- ☐ Check the condition of the sensor batteries and replace them if necessary. See “Sensor Battery Replacement” on page 8.

Smart Bypass Control Feature

The Smart Bypass feature enables you to control the RainSensor system as follows:

Bypass RainSensor system operation when active (during rain)

Press the Smart Bypass button one time. The RainSensor system will be placed in the bypass mode, enabling automatic watering to resume as programmed. The Sensor Status indicator will blink continuously when in the bypass mode.

Bypass RainSensor system operation when inactive (dry)

Press the Smart Bypass button one time. The RainSensor system will be placed in the bypass mode and will ignore the next rainfall. The RainSensor system will automatically reset following the dry-out period.

Resume Normal Operation

The bypass mode will remain in effect until the RainSensor system automatically resets after the dry-out period. To manually release the bypass mode and resume normal operation, press the Smart bypass button one time.

Turn off RainSensor system

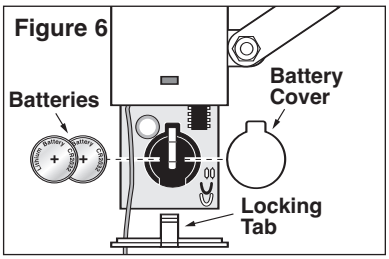
Press and hold the Smart Bypass button until the Sensor Status indicator begins flashing (5–7 seconds). The receiver will turn off and the Power indicator will flash periodically. Press the Smart Bypass button again to resume normal RainSensor system operation.

Attention Required Alert

If the Power indicator begins flashing, attention is required to correct the following possible conditions:

- Sensor battery power is low and should be replaced. See “Sensor Battery Replacement” on page 8.
- A signal reception problem is indicated. If the batteries are in good condition, refer to “About Reception Problems” above to help resolve the problem.

Sensor Battery Replacement



1. Release and remove the bottom of the sensor housing by pressing inward on the locking tabs. Carefully slide the circuit board out. See Figure 6.
2. Remove the battery cover and old batteries. Insert two 3V Lithium batteries (CR2032 or equivalent) under the retaining clip with the positive (+) side facing the clip.
3. Reassemble the sensor in the reverse order.
4. Press and hold the Test Spindle 15–20 seconds to reset the battery save feature.

Resetting the Signal Code

The sensor and receiver are preset at the factory to a matching signal code. If communication cannot be established, resetting the signal code may resolve the problem. Reset the signal code as follows:

1. Press and hold the Smart Bypass button for approximately 15 seconds. The flashing rate of the Sensor Status indicator will change two times.
2. While holding the sensor next to the receiver, press and hold the sensor Test Spindle until the Sensor Status indicator stops flashing, then release.

   Note: Pressing the Smart Bypass button again will exit the reset mode if a valid signal code is not received. For further assistance, contact Toro Customer Support at 1-800-367-8676.

Specifications

Signal Range: Up to 300' LOS

Sensor Type: Hygroscopic disc stack with adjustable rainfall sensitivity

Batteries: (2) 3V-CR2032 (or equivalent)

Operating Temperature: -20°F—120°F

Receiver Power: 22–28 VAC/VDC, 100mA (from timer w/Class 2, UL-approved XFMR)

Contact Rating: NC & NO, 3A @ 24 VAC

FCC Information: This equipment complies with FCC Class B device in accordance with the specifications in Subpart J of Part 15. **FCC ID: OF7WRS1 • IC: 3949104244A**

The Toro Promise — Limited One-Year Warranty

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrants, to the owner, against defects in material and workmanship for a period of one year from the date of purchase.

Neither The Toro Company nor Toro Warranty Company is liable for failure of products not manufactured by them even though such products may be sold or used in conjunction with Toro products.

During such warranty period, we will repair or replace, at our option, any part found to be defective.

Return the defective part to the place of purchase.

Our liability is limited solely to the replacement or repair of defective parts. There are no other express warranties.

This warranty does not apply where equipment is used, or installation is performed, in any manner contrary to Toro's specifications and instructions, nor where equipment is altered or modified.

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