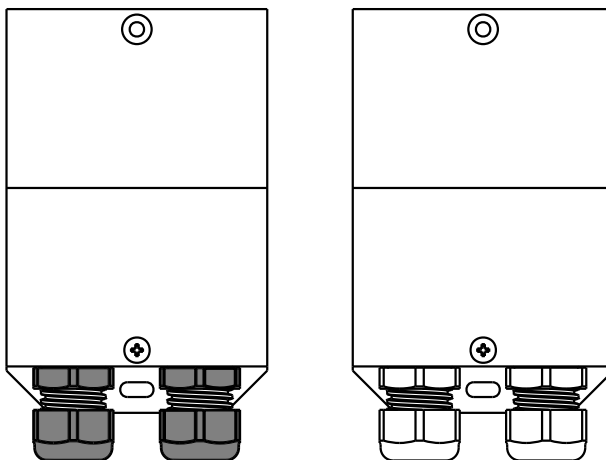




## 2WR4-TRX



## 2-WIRE 4-Zone Controller for Residential Irrigation Systems

User Instructions and Installation Manual

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Document Version 1.10



## Product Description

Thank you for purchasing a Pluvion 2-WIRE residential irrigation controller. Our goal is to provide smarter landscaping products that work like plug-n-play.

Pluvion's 2WR4-TRX provides a smart solution for connecting up to 4 zones in a residential sprinkler system using 2-conductor wiring, providing the following options and benefits to the user:

**Install** a new sprinkler system using low-cost 2-conductor low-voltage landscape wire.

**Repair** an existing system with a damaged sprinkler wire, as long as at least two conductors in the existing multi-conductor sprinkler wire are still functional.

**Expand** a sprinkler system with additional zones without replacing the existing wiring.

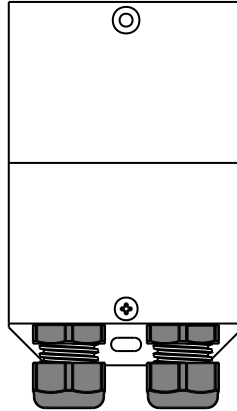
The 2WR4-TRX system consists of a transmitter and a receiver and works in conjunction with standard 24 VAC sprinkler controllers, including internet connected smart controllers. The transmitter is installed near the sprinkler timer while the receiver is installed close to the sprinkler valves/solenoids. Additional transmitters and receivers can be added to the system to support a maximum of 16 irrigation zones connected via a single 2-conductor wire. Notice: this is not a wireless product. A 2-conductor wire between the transmitter and receiver is required.

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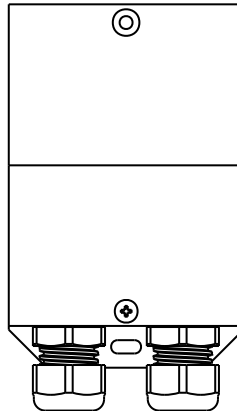
## Contents in the Box

2-WIRE Transmitter (2WR4-TX)  
Identified by **BLACK** connectors



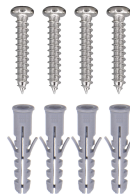
Install near sprinkler timer

2-WIRE Receiver (2WR4-RX)  
Identified by **WHITE** connectors



Install near solenoids/valves

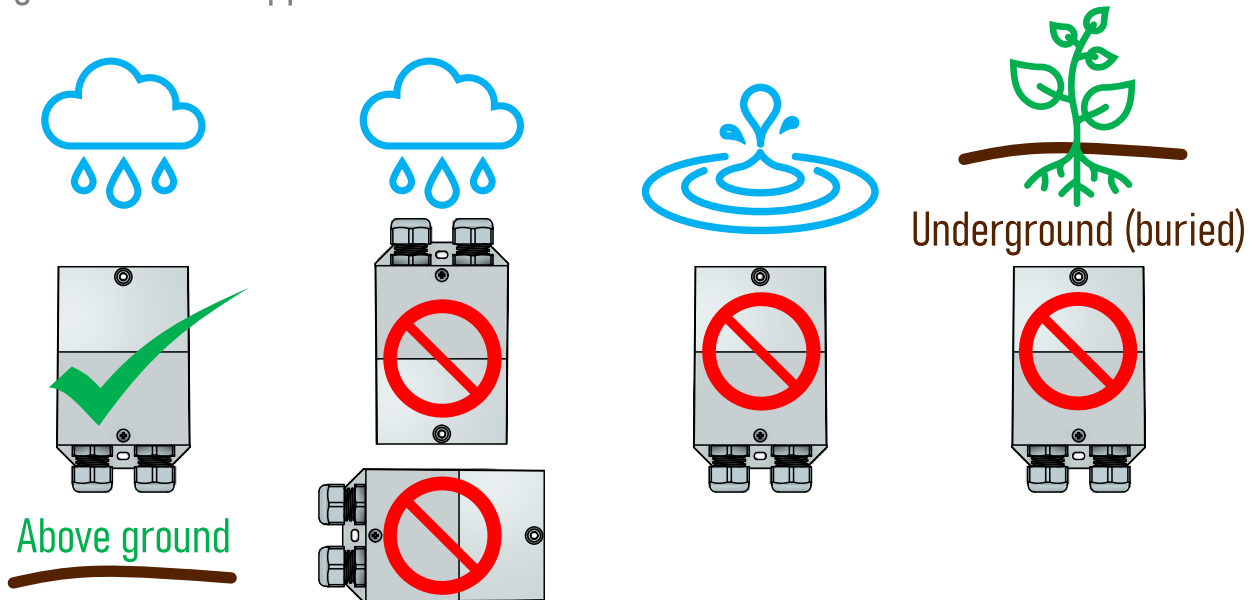
Mounting hardware



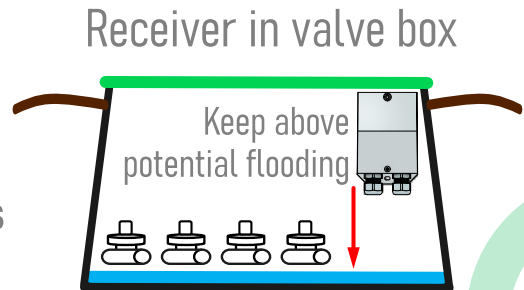
## Requirements for Outdoor Installation

The 2WR4-TRX 2-WIRE system may be installed outdoors. The transmitter and receiver devices are weatherproof provided that they are mounted correctly as shown below.

**!** When installing outdoors, ensure to keep the cable connectors in a downward position to avoid water ingress from rain or other sources. Moist air will not damage the electronics. However, exposure to standing water, for example with devices buried underground is **not** supported.



The 2-WIRE receiver is installed near the valves. In case a valve box is used, the receiver may be installed inside it, as long as the device is **always** above potential flooding in the valve box.



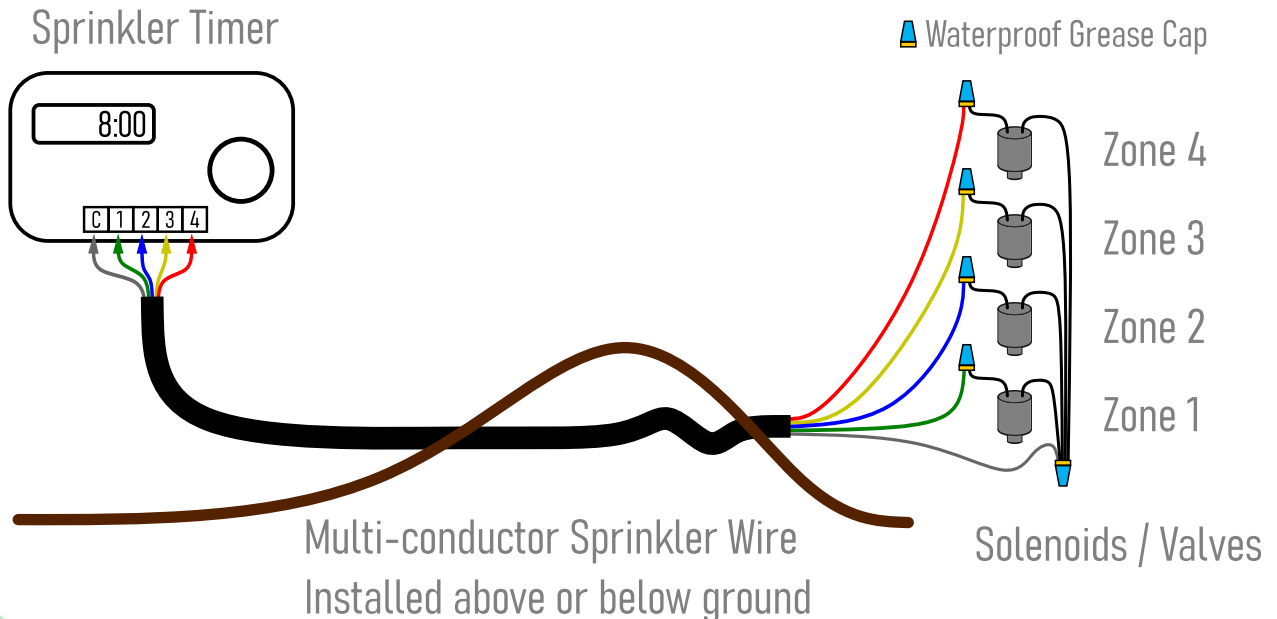
## Repair of an Existing System with a Damaged Sprinkler Wire

A conventional residential sprinkler system uses a multi-conductor wire connecting the timer and the solenoids at the valves. Each of the zones requires a separate conductor. One common return line (**COM**) is shared among all sprinkler zones.

A 4-zone system requires a 5-conductor sprinkler wire. If any of these conductors is damaged, one or more of the sprinkler zones will no longer function.

A Pluvion 2-WIRE system will restore the full system functionality for all zones, as long as at least 2 conductors in the sprinkler wire are still intact.

### Wiring diagram of a conventional residential sprinkler system:



## Step-by-Step Installation: Repair of an Existing System

### Step 1 > Determine the root cause of system malfunctioning

The electrical part of the sprinkler system consists of three components and system failure could be caused by each of them:

- The sprinkler timer
- The sprinkler wire
- The solenoids/valves

Once determined that the sprinkler wire has one or more damaged conductors, Pluvion 2-WIRE can repair the system as long as 2 conductors in the wire are functional. Notice that this device supports 4 zones in a single transmitter/receiver, but may be used for 2 or 3 zones, leaving unused zones unconnected.

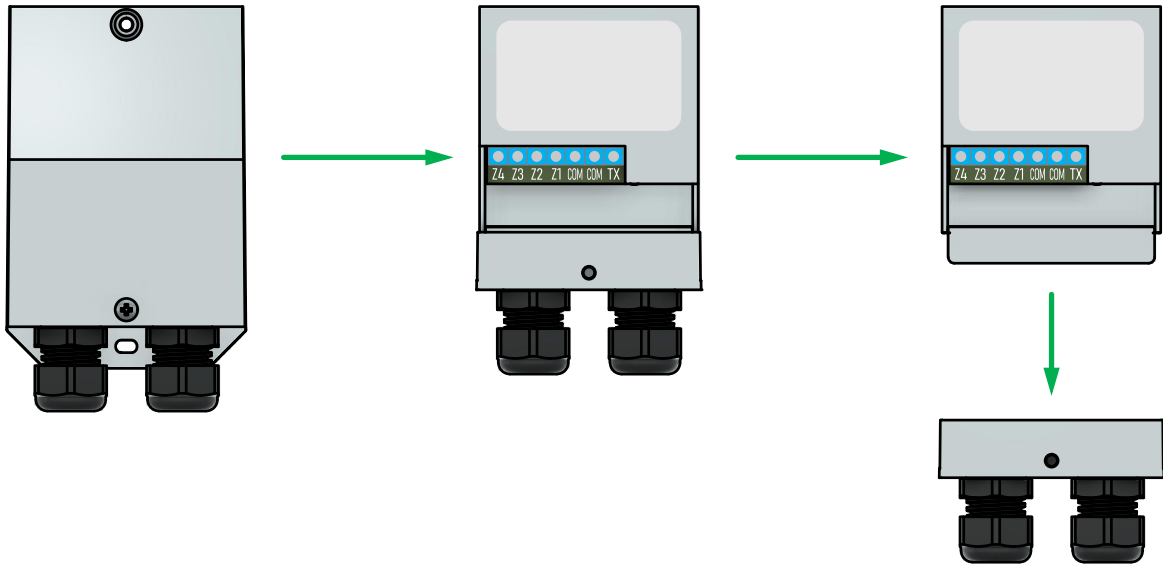
### Step 2 > Identify conductors to be used for the 2-WIRE interface

Unplug the sprinkler timer from the power source. Identify two functional conductors that will be used for the 2-WIRE interface. Commonly a white conductor is used for the **COM** or **C** signal, but any color conductor can be used for **COM** as well. If the white conductor is used for **COM** in the original installation and this conductor is non-functional, any other color functional conductor may be used for **COM**.



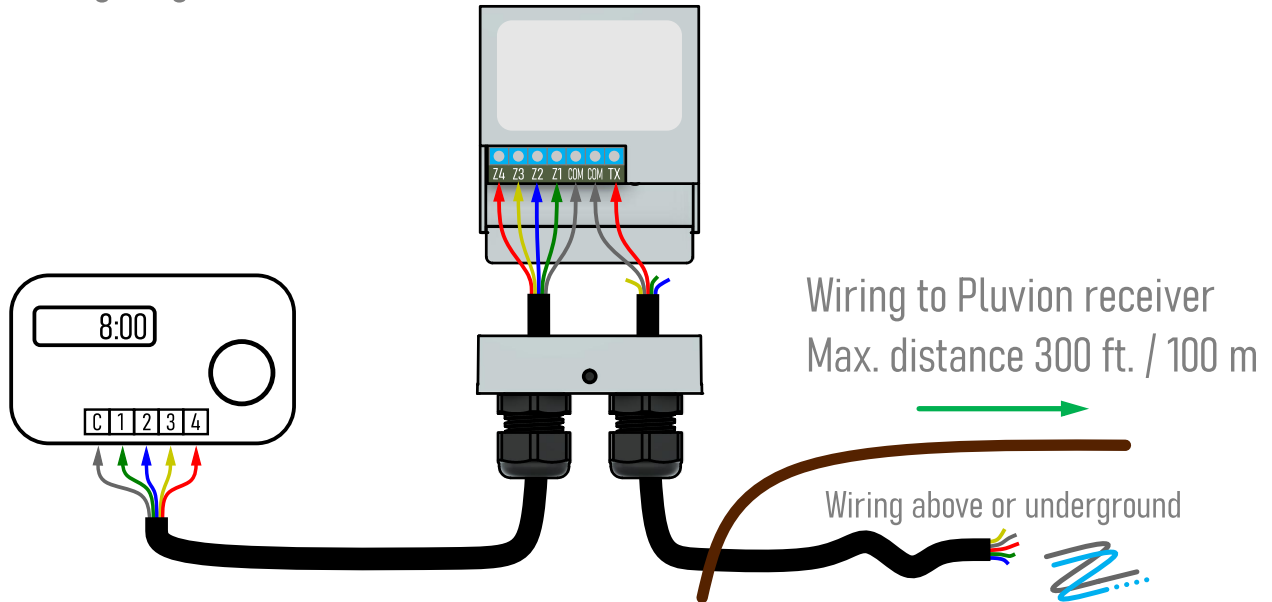
### Step 3 > Open the transmitter enclosure

Open the transmitter by removing the screw that holds the enclosure in place. The transmitter is identified by BLACK connectors. Remove the enclosure, and then pull the connector base from the board assembly:



## Step 4 > Connect the transmitter to the sprinkler timer

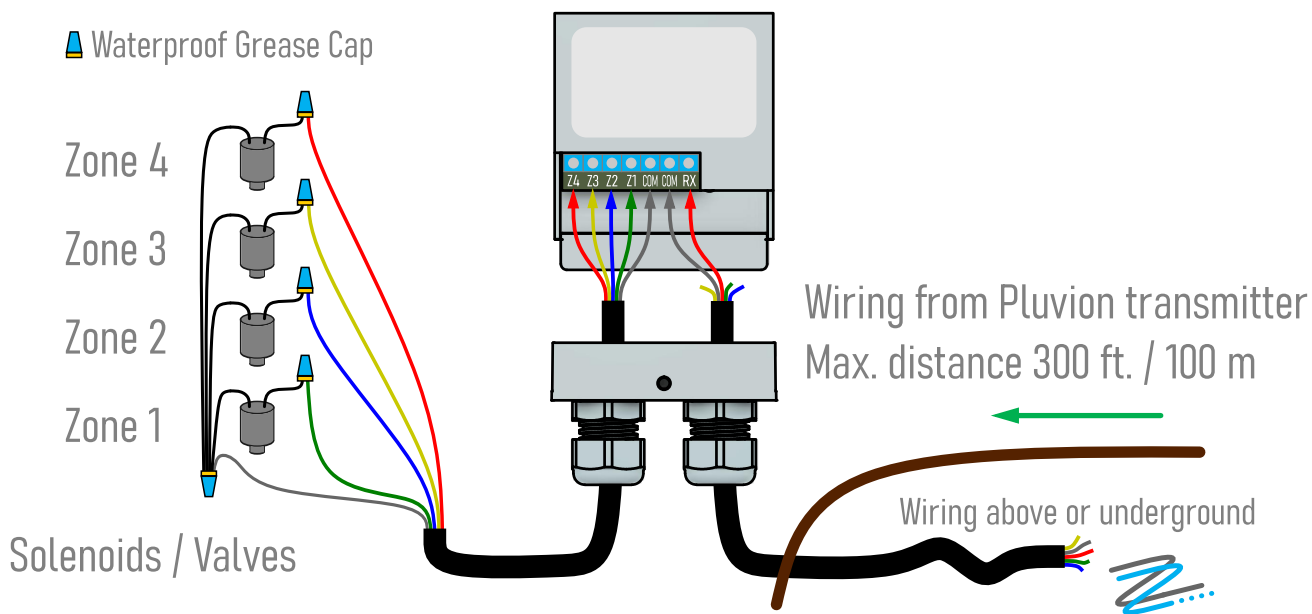
Install the transmitter near the sprinkler timer. Cut the original sprinkler wire at 2-3 ft. from the sprinkler timer and connect the transmitter as indicated in the following diagram:




The 2-WIRE interface will be connected to terminals **COM** and **TX** and can use any two functional conductors of the original sprinkler wire as determined in step 2. Insert the connector base back into the board assembly. Tighten the wire connectors **after** ensuring a proper fit of the wiring between the base and the terminal block and only once the base is fully inserted into the board assembly.

## Step 5 > Open the receiver enclosure and connect it to the solenoids

Open the receiver by removing the screw that holds the enclosure in place. The receiver is identified by WHITE connectors. Remove the enclosure, and then pull the connector base from the board assembly, like in Step 3.




The connections to the solenoids/valves and grease caps can be retained. Cut the sprinkler wire at 2~3 ft. of the end. The receiver will be connected to the 2-WIRE interface from the transmitter as shown in the above diagram using terminals **COM** and **RX**.

 Use the same 2 conductors as connected in the transmitter and cut the unused conductors. The short stub of sprinkler wire attached to the solenoids will be connected to the zone terminals (**Z1, Z2, Z3** and **Z4**) and the second **COM** terminal. It is recommended to keep the original conductor colors to avoid accidentally swapping zone numbers in the system. For example, if the red conductor is connected to zone 1 at the sprinkler timer and **Z1** at the transmitter, also connect the red conductor to **Z1** at the receiver.

Insert the connector base back into the board assembly. Tighten the wire connectors after ensuring a proper fit of the wiring between the base and the terminal block and only once the base is fully inserted into the board assembly.

### Step 6 > Reinstall enclosures and mount devices

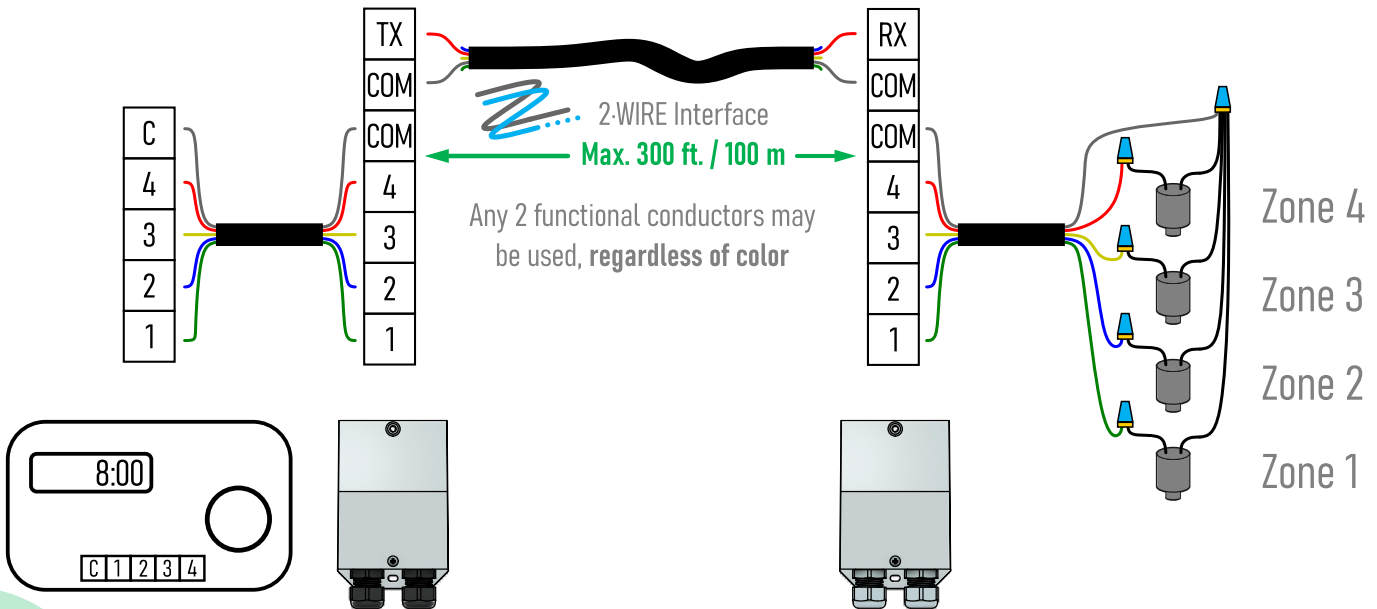
Reinstall the enclosures of the transmitter and receiver using the single screw on the device enclosure. Mounting of the Pluvion devices: it is recommended to mount the transmitter on the wall close to the sprinkler timer. The receiver may be wall mounted near the valve assemblies. If wall mounting is not an option in this location, it is recommended to mount the receiver to one of the PVC irrigation conduits using a snap ring.

 Always keep the transmitter and receiver above ground level, away from standing water and with the wire connectors facing down.

## Step 7 > Verify complete system installation and test sprinkler operation

Reconnect the sprinkler timer to the power supply. Manually test each of the zones to ensure correct and successful operation. The transmitter and receiver include a status LED on the board assembly. During normal operation the LED will indicate the active zone by the number of short flashes, for example, when zone 3 is active the LED will blink three times, repeated after a short pause. This feature is useful for troubleshooting and may require the enclosure to be removed for monitoring.

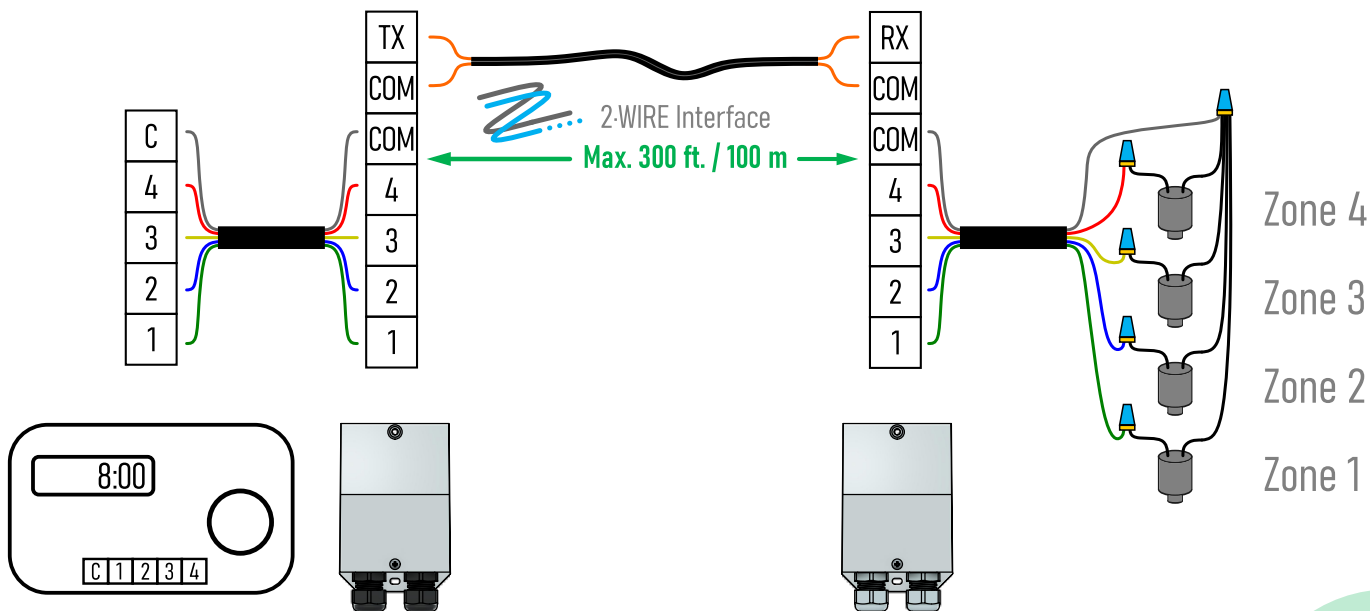
For reference the complete 2-WIRE wiring diagram and components are shown below.



## New Sprinkler System Installation Using Low-Cost Low-Voltage Landscape Wire

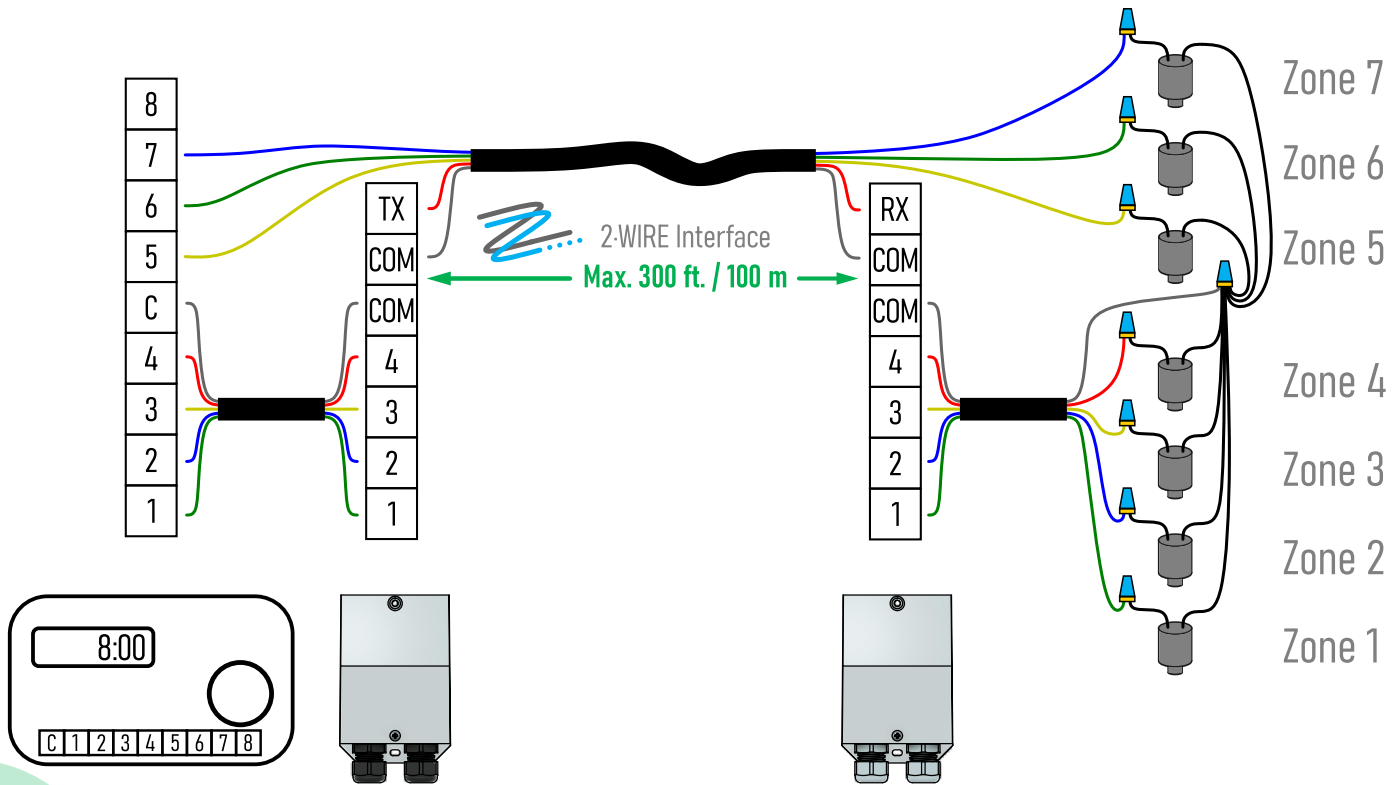
Using Pluvion 2-WIRE, a new sprinkler system may be installed using low-voltage direct burial 18/2 landscape wiring. This will provide a low-cost wiring solution for up to 300 ft. (100 m) between the sprinkler timer and the valve assemblies. To connect the sprinkler timer to the transmitter, and the receiver to the solenoids it is recommended to use a short (2-3 ft.) 5-conductor sprinkler wire as a jumper wire.

Follow the instructions as in the previous section, while using low-voltage landscape wire (18/2) for the 2-WIRE interface between the transmitter and the receiver.



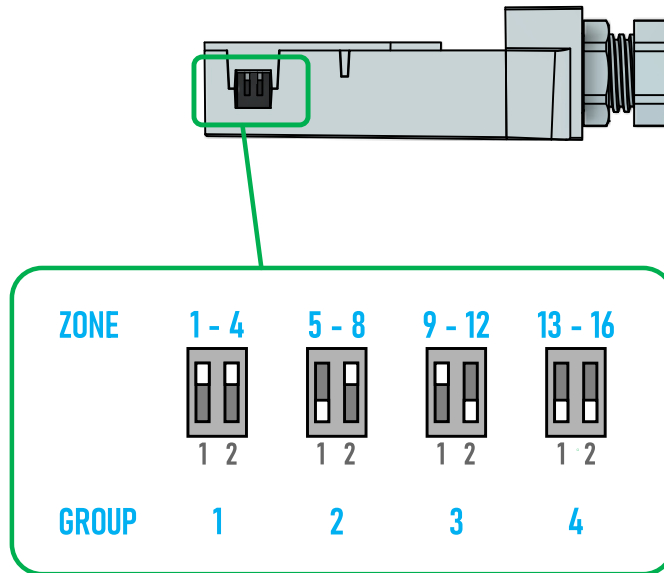
## Adding Zones to a Sprinkler System Using an Existing Sprinkler Wire

Adding zones to an existing sprinkler system usually requires replacement of the wire between the sprinkler timer and the valve assemblies. Pluvion 2-WIRE provides an efficient solution to expand the number of zones, while re-using the existing sprinkler wire that is already installed in the landscape area. For example, when upgrading the sprinkler timer from a 4-Zone to 8-Zone timer, an existing 5-conductor sprinkler wire can be used to control 7 Zones by adding a Pluvion transmitter and receiver to the system. **A wiring diagram for this expanded system is as follows:**



## Multiple Transmitters and Receivers to Support up to 16 Sprinkler Zones

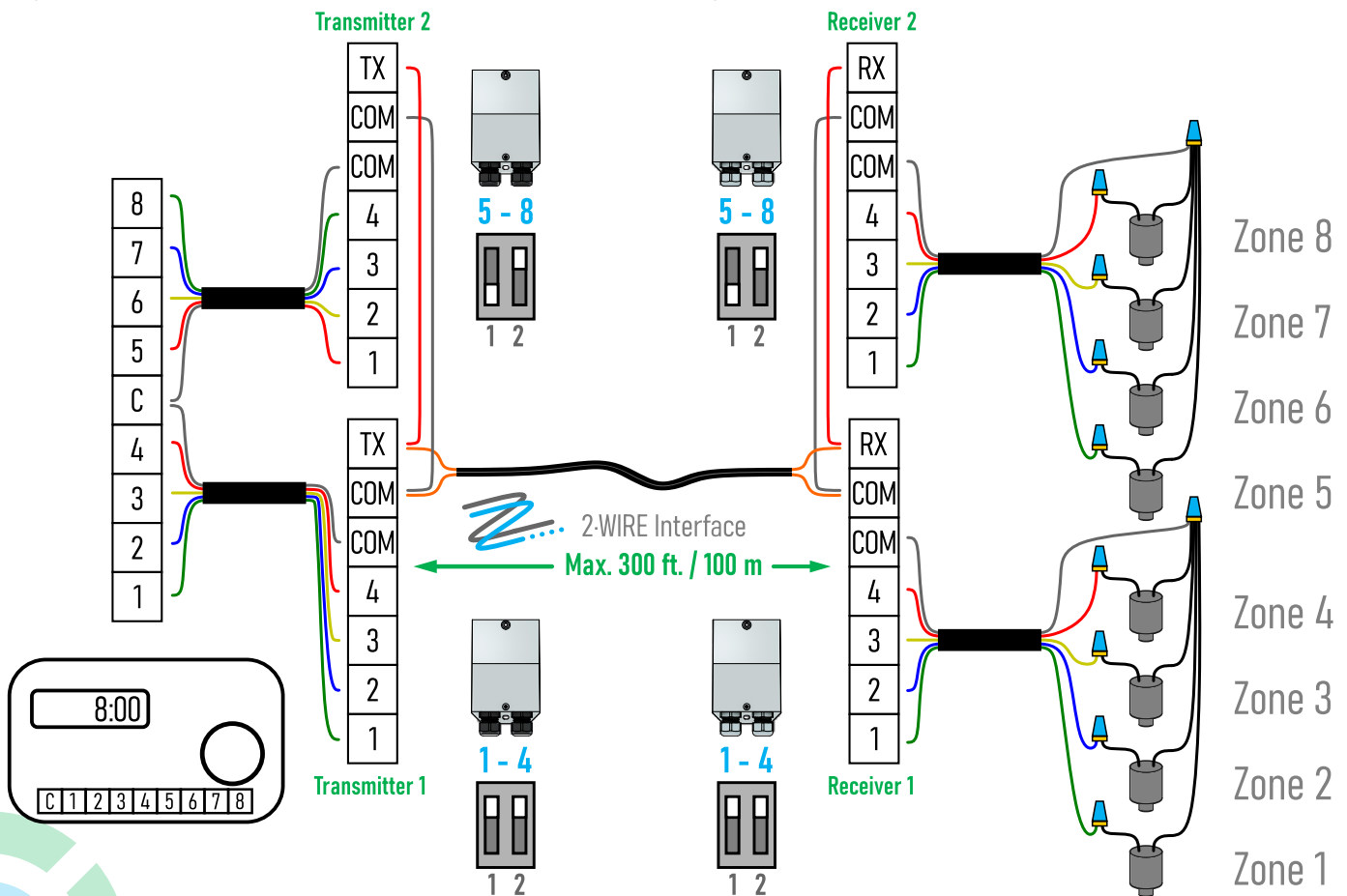
Up to 4 transmitters and receivers can be combined in a single sprinkler system to support up to 16 Zones using a 2-WIRE interface, using existing or new wiring and only 2 conductors in the wire. A transmitter or receiver may be assigned to one of four groups and each group controls 4 zones. The board assembly of the transmitter and receiver includes a DIP switch to set the group number of the device:



**!** Multiple transmitters and receivers can be used in combination with a single sprinkler timer **only**. Using more than one sprinkler timer may damage the system.



**!** Each of the transmitters **MUST** be assigned a unique group number. Each of the receivers **MUST** be assigned a unique group number. Having multiple transmitters (or multiple receivers) with the same group number may result in system malfunction or damage. A transmitter and receiver assigned to the same group will communicate to each other. Once transmitter and receiver pairs have been configured for unique group numbers, **wire the system as illustrated below**. This diagram shows an 8 zone system. It can be extended to 12 or 16 zones by adding 1 or 2 sets of devices.



## Troubleshooting

The troubleshooting guide in this section is based on a single transmitter/receiver system only. Troubleshooting for a system using multiple transmitter/receiver pairs can follow a similar step-by-step process for each of the devices in the system.

In case any of the zones does not turn on as expected check the operation of the transmitter first:

1. Remove the transmitter enclosure.
2. Manually turn on zone 1 at the sprinkler timer and observe the LED at the right hand side of the transmitter board assembly. A short burst of the LED indicates communication between the transmitter and the receiver. After this burst, the transmitter works properly if the LED blinks a single time, followed by a short pause, repeated while the zone is active.  
The transmitter includes a short circuit detection. In case the wiring or solenoid has a short circuit the LED will be constantly on, and the system shut down.
3. Repeat this process by manual activation of zone 2, 3 and 4. The LED will blink 2, 3 or 4 times, followed by a short pause for zone 2, 3 and 4 respectively, repeated while the zone is active.
4. If the transmitter LED does not show activity status for any or some of the zones, verify the wiring between the sprinkler timer and the transmitter. It is recommended to use an AC voltage meter to ensure that an active zone shows approximately 24 VAC between the zone terminal and **COM**.

Once it has been confirmed that the transmitter is working properly and the system still malfunctions, continue to remove the receiver enclosure:

5. Verify that the group setting (DIP switch) matches the group set at the transmitter.
- 6.. Manually turn on zone 1 of the sprinkler timer and observe the LED at the right hand side of the receiver board assembly. A short burst of the LED indicates communication between the transmitter and the receiver. After this burst, the receiver works properly if the LED blinks a single time, followed by a short pause, repeated while the zone is active. If the LED burst is present, but no blinking afterwards, verify that the solenoid is working properly or replace it.
7. Repeat this process by manual activation of zone 2, 3 and 4. After the initial burst, the LED will blink 2, 3 or 4 times, followed by a short pause for zone 2, 3 and 4 respectively, repeated while the zone is active.
8. If the receiver LED does not show activity status for any or some of the zones, verify the connection of the 2-WIRE interface to terminals **COM** and **RX**. When any zone is active, approximately 24 VAC will be measured between the **RX** and **COM** terminals. If no voltage is measured at these receiver terminals, verify that 24VAC is measured between the transmitter **TX** and **COM** terminals when any zone is active. If the voltage is measured at the transmitter, but not at the receiver, ensure that the 2 conductors used for the 2-WIRE interface between the transmitter and the receiver are functional and the same color conductors are used on both ends.

## Limited Warranty

Pluvion Technology Inc. warrants to its customers that its products will be free from defects in materials and workmanship for a period of one (1) year from the date of original purchase.

Pluvion Technology Inc. will replace or repair the product found to be defective under normal use for a period of one (1) year after purchase. Proof of purchase is required. This warranty does not cover any damage caused by the owner modifying, attempting to fix, or otherwise altering the product.

Damage caused by water ingress due to incorrect installation is not covered.

Pluvion Technology Inc. will not be responsible for consequential or incidental cost or damage caused by the product failure. Pluvion Technology Inc. liability under this limited warranty is restricted only to the replacement or repair of the defective product.

To obtain warranty service, please email [info@pluviontech.com](mailto:info@pluviontech.com) for further instructions.

This warranty is the sole and exclusive warranty. No employee, dealer, or other person is authorized to alter this warranty or make any other warranty on behalf of Pluvion Technology Inc.

## Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following conditions:

1. This device may not cause interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Modifications not expressly approved by the responsible party could void the user's authority to operate this equipment.

Note: 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 this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of 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.

This digital apparatus complies with Canadian ICES-003(B).

Cet appareil numérique est conforme à la norme NMB-003(B) du Canada.

Please Recycle 



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SKU: 2WR4TRX0  
Document Version 1.10 (2025)

 Designed and assembled in Canada  
from components of China