

2-Wire Path Layout and Connections

The design of a system that uses the ESP-LXD 2-Wire Decoder Controller requires careful consideration to the layout of the decoders on the 2-Wire path. Since a decoder system powers the electric solenoids through the 2-wire path, the 2-wire path must be able to provide enough voltage to power the solenoids. There are design specifications limiting the length of the 2-wire Critical Path which can be found on the next page.

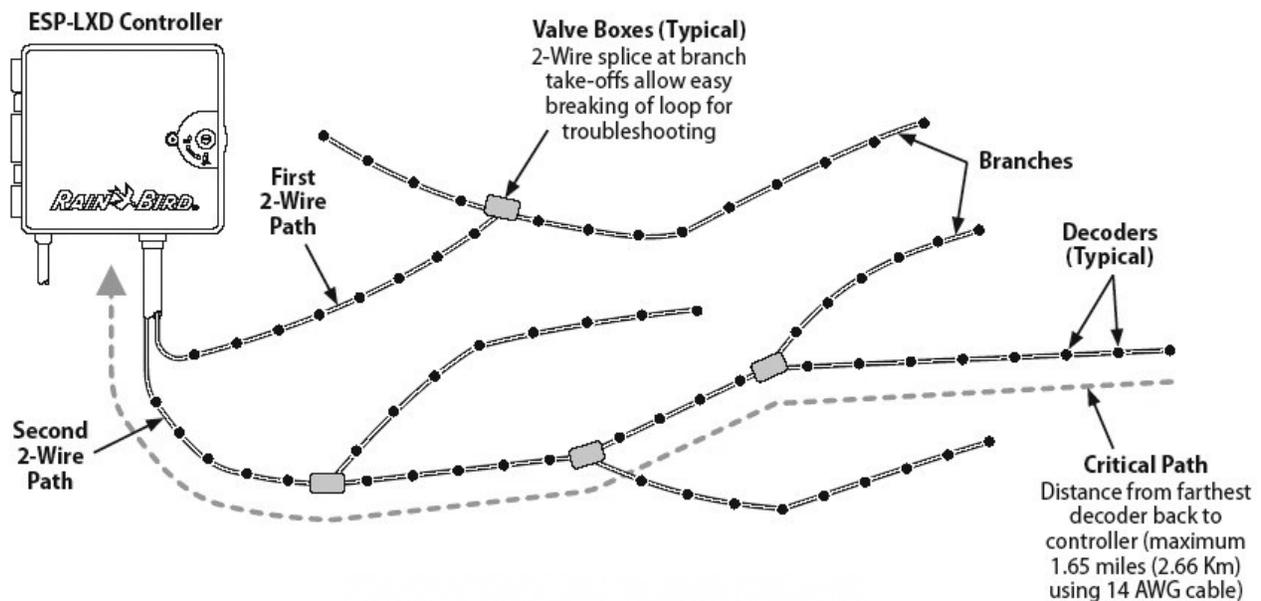
2-Wire Configurations

There are two types of configurations that can be used for the layout of 2-wire paths: STAR or LOOP. The controller will supply up to four separate 2-wire paths for a STAR configuration and up to two separate 2-wire paths for LOOP configurations. Depending upon the design of the site, it is preferable to separate the 2-wire paths into multiple wire runs rather than install a single 2-wire path throughout the site. These wire paths can be configured in either the STAR or LOOP layout or a combination of the two types. For ease of troubleshooting, the STAR configuration is recommended.

Star Configuration

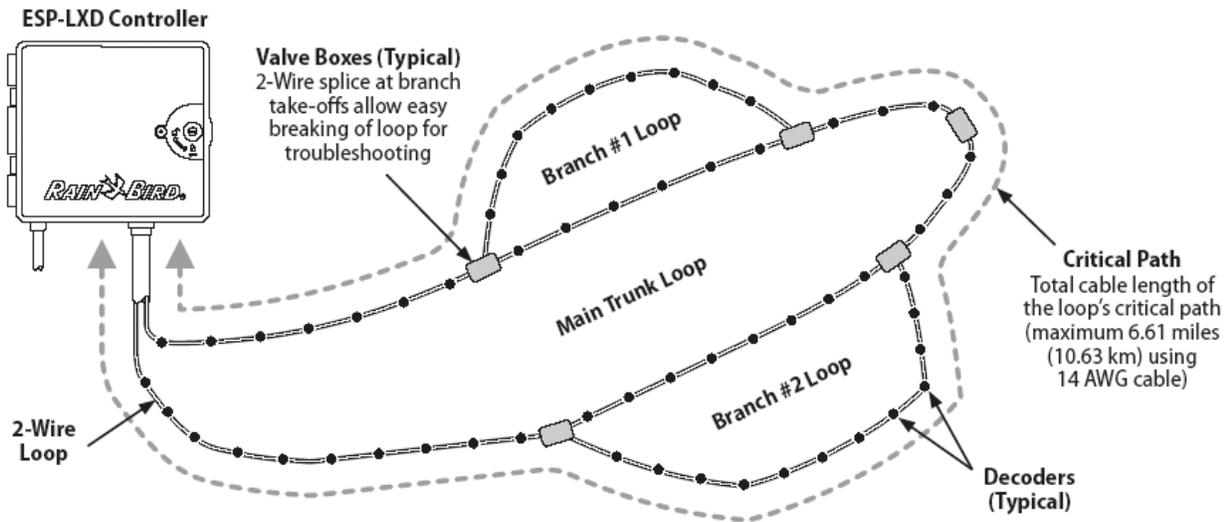
For normal installations with 2-wire path runs that are not excessively long, the recommended layout for the 2-wire path is the STAR configuration. This is to facilitate ease of troubleshooting the system should it experience a wire fault or short. The distance of the farthest decoder from controller measured along the 2-wire path is considered the Critical Path of the 2-wire cable for a STAR configuration. The maximum distance for the Critical Path is 1.65 miles for 14 AWG Maxi Cable, and 2.63 miles for 12 AWG Maxi Cable. For metric cable the maximum distance for the Critical Path is 3.0 Kilometers for 2.5 mm² cable.

2-Wire Path Star Pattern Design



Loop Configuration

If the installation requires longer wire runs than are possible with the STAR configuration (farther than 1.65 miles away from the controller) then a LOOP configuration may be used. A LOOP configuration requires looping the 2-wire path out to the farthest decoder then back to the controller. In a LOOP configuration, the Critical Path is the distance measured by following the 2-wire path around the loop out to the farthest decoder and back to the controller. The maximum distance for the Critical Path for a LOOP configuration is 6.61 miles for 14 AWG Maxi Cable and 10.52 miles for 12 AWG Maxi Cable. For metric cable the maximum distance for the Critical Path is 12.0 Kilometers for 2.5 mm² cable.

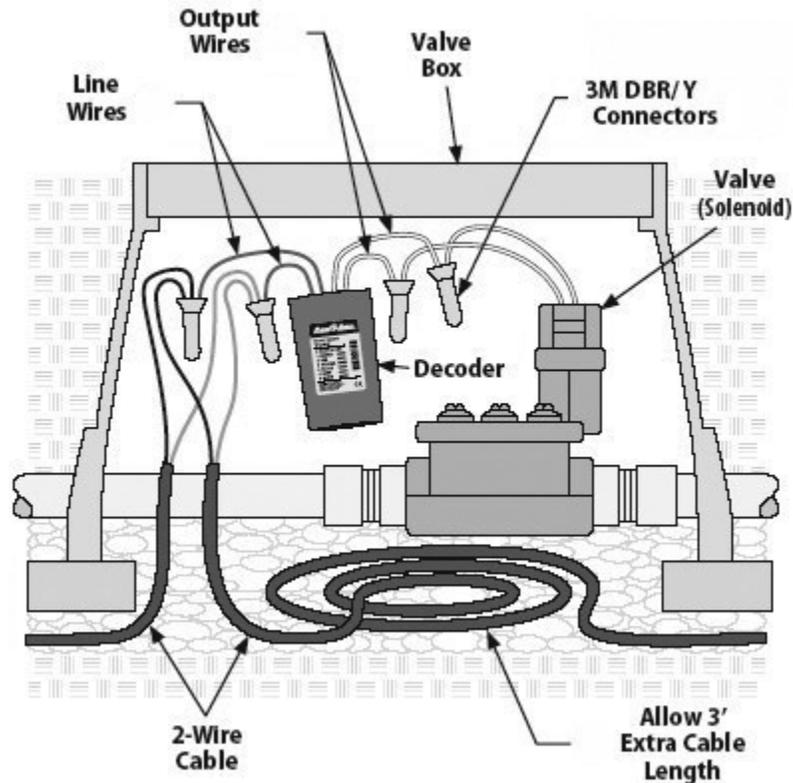


2-Wire Path Loop Pattern Design

Maximum Critical Path Lengths for 2-Wire Paths					
Nominal Wire Size	Ohms per 1000' or Ohms per Km (per conductor)	Max. Length For Critical Path			
		Star		Loop	
		Km	Miles	Km	Miles
2.5 mm ²	7.5 Ohms/Km	3.00	1.86	12.00	7.46
14 AWG	2.58 Ohms/1000'	2.66	1.65	10.63	6.61
12 AWG	1.62 Ohms/1000'	4.23	2.63	16.93	10.52

Decoder to Solenoid Layout

All valves must be connected to field decoders for irrigation management by the controller. Decoders must be wired both to a valve and by splicing to the 2-wire path. Splices and field decoders should always be placed in valve boxes (except when valve-in-head sprinklers are used, which can be directly buried).



NOTE: For secondary wire run, the distance between the field decoder and the solenoid (valve) can not exceed 450 feet (137 meters) using 14 gauge wire.

Valve Types

The ESP-LXD controller is compatible with the following Rain Bird Commercial Valves:

- PGA Series
- PEB/PESB/PESBR Series
- EFB-CP Series
- BPE/BPES Series

NOTE: The ESP-LXD controller will not work with Rain Bird Residential Valves including DV, JTV, HV, ASVF Series Valves.

The ESP-LXD 2-Wire Decoder Controller is also compatible with Rain Bird Golf Valve-in-Head Rotors and Rain Bird Commercial PSR-Series Pump Start Relays.