ESP-LXD 2-Wire Controller Series: MAXI Cable, Grounding and Surge Protection

In this article we'll cover the right type of wire to use with the ESP-LXD 2-Wire Decoder Controller, and grounding and surge protection guidelines.

2-Wire Cable & Splices

MAXI Cable

Use only MAXI Cable for 2-wire path applications. MAXI Cable is double-jacketed with solid copper wire and is non-twisted for reliable communication. MAXI Cable is rated for direct burial.

TIP: MAXI Cable comes in several colors which can be useful when troubleshooting if you use a different color for each separate wire path.

MAXI Cable Specifications

Construction:	Special irrigation control wire
Conductor:	Tin coated, soft drawn bare copper (ASTM Spec. 33) Two (2) conductors Solid (14 awg and 12 awg)
Insulation:	Polyvinyl Chloride (PVC)
Outer Jacket:	Polyethylene (PE)
Colors:	Red, White, Black, Orange, Blue, Yellow, Purple, Brown, Pink, Grey, & Green
Temperature:	60°C
Voltage:	600 volts

Wire Splices

Use only 3M DBR/Y-6 splice kits for all electrical wiring connections to the 2-wire path.

Grounding & Surge Protection

The ESP-LXD and the 2-wire path must be properly surge protected and grounded to prevent damage to the controller and the irrigation system. Failure to do so could result in increased troubleshooting time, controller failure and a voided warranty.

To comply with proper installation specifications, the following components should be grounded:

- ESP-LXD 2-Wire Decoder Controller
- ESPLXD-M50 2-Wire Decoder Module
- LSP-1 Lightning Surge Protector
- SD-210 Sensor Decoder
- FD-401 Field Decoder
- FD-601 Field Decoder

1. Each installed grounding system shall maintain a maximum ground resistance of 10 ohms, or less.

2. Refer to the Rain Bird Grounding Recommendations for proper specifications on Grounding System Installation and Grounding System Design.

ESP-LXD 2-Wire Decoder Controller

The ESP-LXD 2-Wire Decoder Controller is protected against electrical surges through the ground provided by the primary ground of the incoming power to the controller.

ESPLXD-M50 2-Wire Decoder Module

The ESPLXD-M50 2-Wire Decoder Module provides a ground lug on the front of the module that accepts a #6 AWG Bare Copper Wire that is connected to a ground rod or plate.

A grounding wire on the module should be connected to the ground (GND) spade connector on the small

terminal strip above the transformer. It is not necessary to connect this ground lug to an earth ground.

Lightning Surge Protector – LSP-1 (Yellow)

The LSP-1 Line Surge Protector provides surge protection for the ESP-LXD controller and the 2-wire path and should be spliced into the 2-wire path in three distinct areas:

1. ESP-LXD 2-Wire Decoder Controller

The LSP-1 Line Surge Protector provides surge protection for the ESP-LXD controller against electrical surges originating from each 2-Wire Path utilized. The LSP-1 Line Surge Protector shall be spliced into each 2-Wire Path in close proximity to the ESP-LXD controller.

2. 2-Wire Path

The LSP-1 Line Surge Protector provides surge protection for the following FD-Series Field Decoders installed on the 2-Wire Path:

- FD-101
- FD-102
- FD-202

Note: The 2-wire path shall be surge protected and grounded with one LSP-1 Line Surge Protector every 500 feet (150 meters) or every 8 decoders, whichever is smaller.

3. Termination of 2-Wire Path

An LSP-1 Line Surge Protector shall be installed at the end of the 2-wire path in a STAR configuration.

SD-210 Sensor Decoder

SD-210 Sensor Decoders have a built-in line surge protector to provide surge protection for each sensor installed on the 2-Wire path.

FD-401 and FD-601 Field Decoder

The FD-401 and FD-601 Field Decoders have a built-in line surge protector to provide surge protection for Field Decoders installed on the 2-Wire Path:

- FD-101
- FD-102
- FD-202

Note: Because the FD-401 & FD-601 Field Decoders and SD-210 Sensor Decoder have built-in surge protection, the 2-wire path surge protection requirement could be stated in the following manner: The 2-wire path shall be surge protected and grounded with one LSP-1, FD-401, FD-601 or SD-210 every 500 feet or every 8 decoders, whichever is smaller.

Consult ESP-LXD 2-Wire Decoder Control System Installation & Troubleshooting Guide for more installation and trouble-shooting tips. Download here.