Connecting Power to the Controller

Connect Ground Wire

The ESP-LXD controller is equipped with built-in electrical surge protection. For this system to function, you must properly ground the controller.

WARNING: The ground wire MUST be connected to provide electrical surge protection. Connect the controller to the grounding grid using at least a #8 AWG (10 mm) or #10 AWG (6 mm) bare copper wire. The wires should be as short and as straight as possible. You will void the controller warranty if you do not ground the controller to a minimum resistance of five ohms.

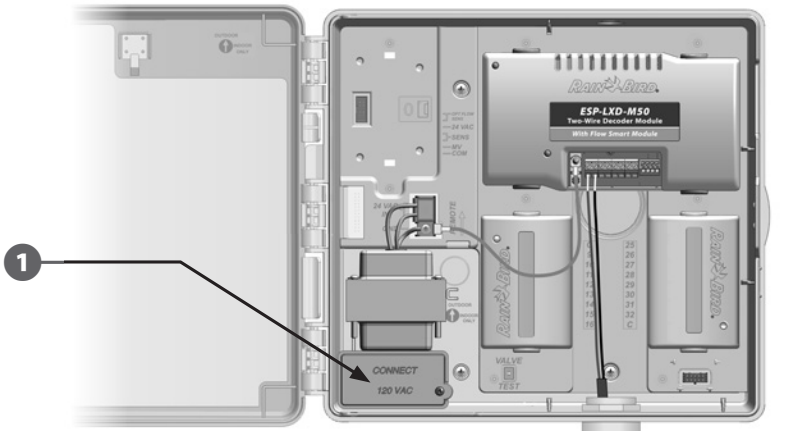
Connect Power Source

The ESP-LXD controller has an internal transformer that reduces supply voltage (120 VAC in U.S. models; 230 VAC in international models; 240 VAC in Australian models) to 24 VAC to operate the decoders connected to the controller. You will need to connect power supply wires to the transformer's three wires.

WARNING: Electric shock can cause severe injury or death. Make sure power supply is turned OFF before connecting power wires.

WARNING: All electrical connections and wiring runs must be made according to local building codes.

1. With the front panel removed, locate the transformer wiring compartment in the lower left corner of the controller cabinet. Remove the screw on the right-hand side and pull the cover off to expose the wiring compartment.

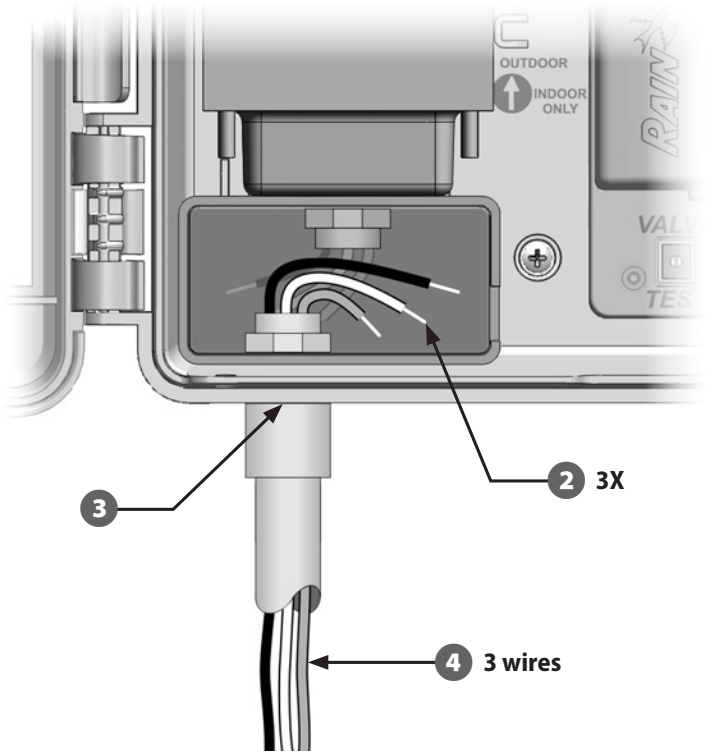


2. Strip the insulation from the three incoming wires to expose approximately 1/2 in (13 mm) of bare wire.

3. Remove the knockout on the bottom of the cabinet below the transformer. Attach a 1/2 in (13 mm) conduit fitting to the bottom entrance of the wiring compartment; then attach conduit to the fitting.

NOTE: 240 VAC (Australian) units do not require a conduit because the power supply cable is already installed.

4. Feed the three supply wires from the power source through the conduit into the wiring compartment.



5. Using wire nuts, connect the wires accordingly (see Table H.1).

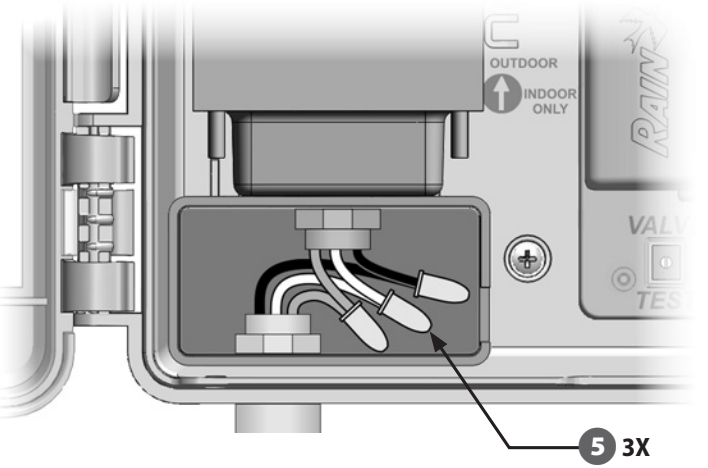


Figure H.1 - Wiring Connections	
120 VAC (US)	**230 VAC (International)**
Black supply wire (hot) to the black transformer wire	Black supply wire (hot) to the black transformer wire
White supply wire (neutral) to the white transformer wire	Blue supply wire (neutral) to the blue transformer wire
Green supply wire (ground) to the green transformer wire	Green-with-yellow-stripe supply wire (ground) to the green-with-yellow-stripe transformer wire

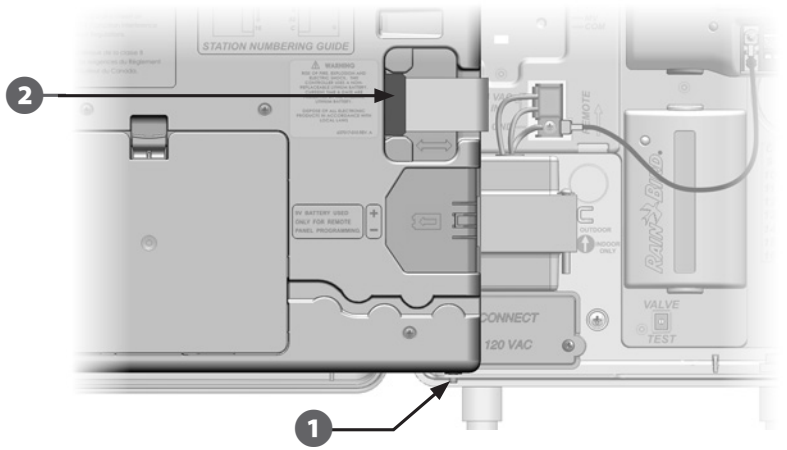
6. Verify that all connections are secure. Then replace the cover of the transformer wiring compartment and secure it with the screw.

Complete Installation

WARNING: To prevent electrical shock, make sure all supply power is OFF before completing installation. Electrical shock can cause severe injury or death.

1. If you removed the front panel, reinstall it now by inserting the top corner pin into the top pin-hole; then push up and rock the bottom corner pin into the lower pin-hole.
2. Reconnect the ribbon cable to the front panel by gently pushing the connector into the socket.

CAUTION: Be careful NOT to bend the pins in the socket.



3. Turn on the power source.

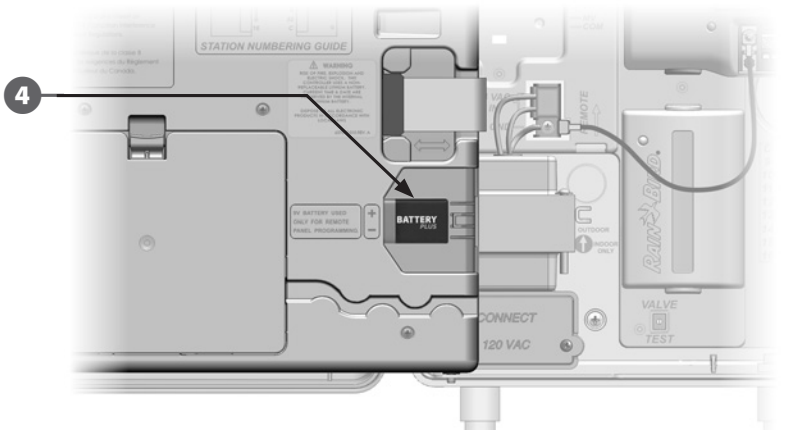
NOTE: The first time you power up the controller, the display will prompt you to select the language you wish to use. See Section E, Set Language for more details..

Programming Under Battery Power

The ESP-LXD controller front panel can operate under battery power for remote programming. This feature is especially useful if the controller is installed in an area that is not easily accessible. It also lets you enter program information before installing the controller at the job site. All program information is stored in nonvolatile memory so it will be preserved indefinitely in the event of a power outage.

NOTE: Under battery power, all programs in progress will continue to run in memory, but irrigation will not occur until power is restored. Without battery power, remaining programs will be cancelled.

4. Install a new 9-volt battery in the battery compartment in the back of the front panel.



NOTE: To perform remote programming, detach the front panel from the cabinet. See Access Controller Cabinet for more details.

CAUTION: The controller can not run irrigation or system diagnostics with the front panel detached. Re-connect the front panel to the controller's AC power source as soon as remote programming is completed.

Connect Decoders to Field Wiring

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: Before installing field decoders, remove the barcode address label from each decoder and attach it to the proper station (or device) number field in the Programming Guide. See Programming Guide instructions for more details.

Wire Splices

NOTE: Label any wires that will be spliced in case troubleshooting is required later.

1. Strip away approximately 6 in (15,24 cm) of the cable's outer sheathing. Rain Bird recommends use of a MAXI cable jacket stripper for this task. The stripping should be done by carefully scoring the outer jacket in at least two places and then gently flexing the cable to loosen the portion of the outer jacket to be removed. It may be necessary to remove the outer jacket in two or more sections.
2. Once the red and black inner wires are exposed, use a wire stripper to strip approximately 5/8 in (1,58 cm) of the insulation away from the ends of the two inner wires.

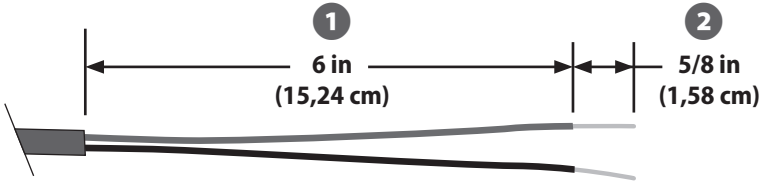


Figure H.2 - Splice for 2-Wire Cable

3. If a splice is needed to support an additional connection to MAXI cable, connect the inner red wire to the additional cable red wire and the black wire to the black wire, using linesman's pliers to gently twist the wires together three or four times. Insert the connections into an approved direct bury splice kit.

WARNING: Use only Rain Bird DB (direct burial) or 3M DBR/DBY splice kits for all electrical wiring connections to the 2-Wire path. Improper wiring can cause serious damage to your controller or irrigation system.

Field Decoder Connections

1. Splice one decoder blue wire to the 2-Wire path red wire; then splice the other decoder blue wire to the 2-Wire path black wire.

   If the decoder is NOT at the end of the two wire path then make a three-way splice; one blue wire from the decoder to the two red wires in the two wire path; then splice the other blue decoder wire to the two black wires in the two wire path (see Fig, H.3).

2. Splice additional wires from the decoder to the valve or valves to be controlled, using a pair of the same color wires for each valve. For example, Rain Bird FD-101 field decoders control a single valve and have a pair of white wires for connection to the valve. Other Rain Bird field decoders are capable of controlling multiple valves. For example, the FD-601 has six additional pairs of wires for connection to up to six different valves.

NOTE: When using field decoders capable of controlling multiple valves, note the wire color combination and decoder address combinations on the side of the decoder. Be sure to connect the wires to the different valves in the order you want your valves controlled, and be sure to affix the decoder labels to your Programming Guide in the same order.

3. Complete the splices to each valve by inserting the field decoder-to-valve splices into an approved direct bury splice kit.

WARNING: Use only Rain Bird DB (direct burial) or 3M DBR/DBY splice kits for all electrical wiring connections to the 2-Wire path. Improper wiring can cause serious damage to your controller or irrigation system.

4. For future troubleshooting or modifications, it is recommended to leave an additional 3 feet of 2-Wire cable stored in each valve box location.

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.

Master Valves and MV Decoders

Up to five master valves can be connected to the ESP-LXD controller through field decoders attached to the two wire path. Master valves are connected to field decoders using the same processes as described previously. Be sure to attach the decoder barcode label to the Programming Guide as a master valve decoder instead of a normal station decoder.

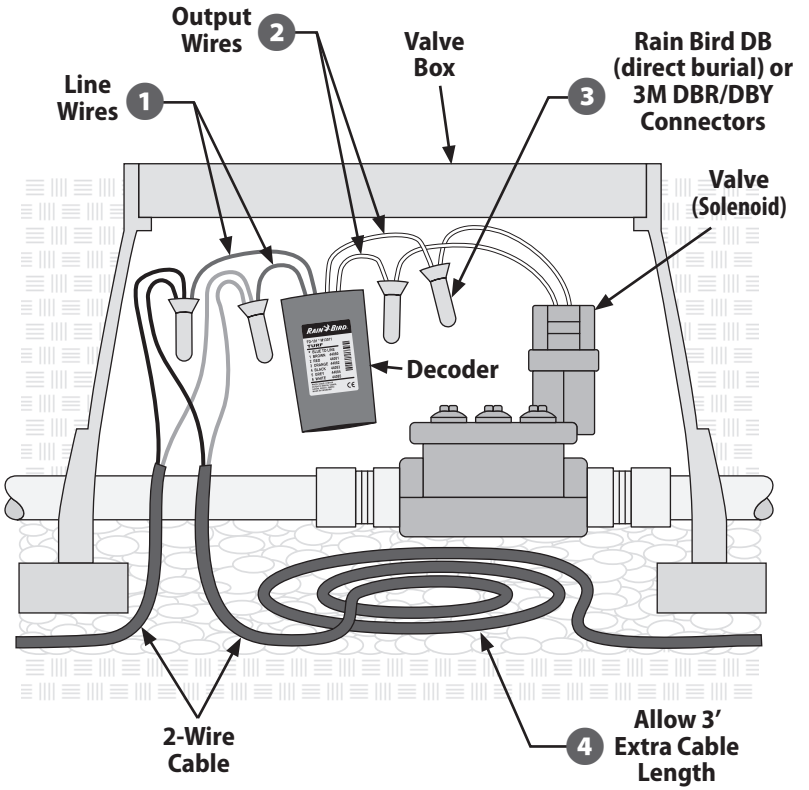


Figure H.3 - Typical Field Decoder Wiring

Surge Protection and Grounding

WARNING: The ESP-LXD controller and the 2-Wire path must be properly surge protected and grounded. Doing so can help prevent damage to the controller and irrigation system and also significantly reduce troubleshooting, repair time and expense. Failure to do so could result in failure of your controller and voiding the warranty.

Rain Bird requires the 2-Wire path to be surge protected and grounded with one LSP every 500 feet or every 8 decoders, whichever is smaller. Ensure that all grounding devices are compliant with local electrical codes.

Install Lightning Surge Protectors (LSP-1s)

1. Using a design drawing or as-built diagram for your installation system, determine the number of LSP-1s required and where they will need to be installed.
2. At the first LSP-1 location, install a grounding device, typically a grounding rod or plate, which meets all local codes, near the 2-Wire path.
3. Splice the blue wires from a Rain Bird LSP-1 to the 2-Wire path in the same manner as the installation of a field decoder detailed above, completing the splices with an approved direct-bury splice kit.
4. Connect the ground wires from the LSP-1 to the grounding device and install the LSP-1 inside a valve box.
5. Repeat this process to install all other LSP-1s as needed, noting their locations on your as-built diagram and/or design drawings.

NOTE: LSP-1s do not have decoder addresses, so it's not necessary to capture this information from your LSP-1s. For this reason, LSP-1s also do not have peel-off barcode labels for the Programming Guide. LSP-1s do not need to be recognized by or programmed into the controller or noted on the Programming Guide.