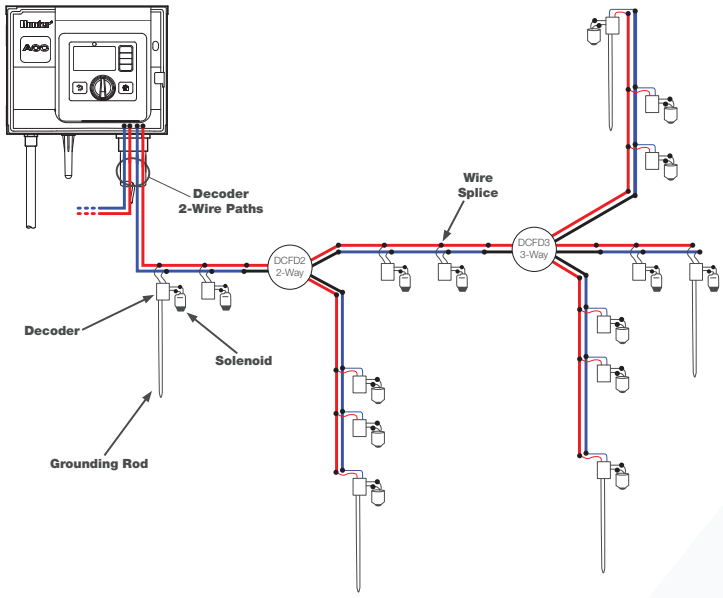
EARTHING INSTRUCTIONS FOR CONVENTIONAL AND DECODER SYSTEMS



Controllers

The irrigation controller earth ground connection is isolated from the primary AC power and is used to ground incoming surges from the communications and output valve wires and is separate to the AC earth. Never connect the controller earth ground connection to a building ground wire, it must be independently grounded.

At the very minimum, the grounding circuit for controllers will include a copper clad steel ground rod, a copper ground plate and 2 x 22.7kg bags of PowerSet® earth contact material, as defined below and per the following detail.

Grounding rods are to have a minimum diameter of 16mm (5/8") and a minimum length of 2.4m (8ft) (Hydro Connect Part # HC-GR096C). These are to be driven into the ground in a vertical position or an oblique angle not to exceed 45 degrees at a location 2.4-3.0m (8-10 ft) from the electronic equipment or the wires and cables connected to it, and at right angles to the two-wire path.

The copper grounding plate assemblies (Hydro Connect Part # HC-GP096) are to be made of a copper alloy intended for grounding applications and will have minimum dimensions of 100mm x 2.4m x 1.6mm (4" x 96" x 0.0625") a 7m (25 ft) continuous length of 13.3 mm² (6AWG) insulated copper wire is to be attached to the plate using an approved welding process.

Two (2) 22.7kg bags of PowerSet® (Hydro Connect Part # HC-GPSET) earth contact material must be spread so that it surrounds the copper plate evenly along its length within a 150mm (6") wide trench per detail below. Salts, fertilizers and other chemicals are not to be used in an attempt to improve soil conductivity because these materials are corrosive and will cause the copper conductors and electrodes to erode and become less effective with time.

Install all grounding circuit components in straight lines. When it is necessary to make bends, do not make sharp turns. To prevent the electrode-discharged energy from re-entering the underground cables, all electrodes shall be installed 2-2.4m (6-8ft) away from said cables. If more than one electrode is used to achieve lower resistance, the spacing between any two electrodes shall be 4.5-6m (15-20ft), so that they don't compete for the same soil.

Decoder Controller Cables

Code	Description
HC-ID07BLU100	ID0.7 Decoder Irrigation Cable Twisted 2 Core 16 AWG (1.35mm²) 100m
HC-ID071BLU	ID0.7 Decoder Irrigation Cable Twisted 2 Core 16 AWG (1.35mm²) 500m
HC-ID1BLU100	ID1 Decoder Irrigation Cable Twisted 2 Core 14 AWG (2.1mm²) 100m
HC-ID1BLU	ID1 Decoder Irrigation Cable Twisted 2 Core 14 AWG (2.1mm²) 500m
HC-ID2BLU	ID2 Decoder Irrigation Cable Twisted 2 Core 12 AWG (3.3mm²) 500m

Direct Burial Cable Connector

Code	Description
HC-WCDBRY6	DBR/Y-6 3M Direct Bury Cable Connector

Earth Grounding & Control

Code	Description
HC-DCFD	DCFD - Inline Decoder Cable Fuse Device
HC-DCFD2	DCFD - 2 Way Decoder Cable Fuse Device
HC-DCFD3	DCFD - 3 Way Decoder Cable Fuse Device
HC-GR096	Decoder Grounding Rod 5/8 x 8' with 4.5m x 5.3mm² (#10AWG) insulated wire
HC-GP036	Decoder Grounding Plate 4" x 36" with 3m x 5.3mm² (#10AWG) insulated wire
HC-GR096C	Controller Grounding Rod 5/8" x 8' with 4.5m x 13.3mm² (#6AWG)insulated wire
HC-GP096	Controller Grounding Plate 4" x 96" with 7m x 13.3mm² (#6AWG) insulated wire
HC-GRCLAMP	Grounding Rod Clamp 5/8"
HC-GPSET	Powerset Earth Contact Backfill 22.7kg bag

Decoder Systems

The earth-to-ground resistance of this circuit is to be measured using a Megger®, or other similar instrument, and the reading is to be no more than 10 Ohms. If the resistance is more than 10 Ohms, then additional ground plates and PowerSet® are to be installed in the direction of an irrigated area. It is required that the soil surrounding copper electrodes be kept at a minimum moisture level of 15% at all times by dedicating an irrigation station at each controller location.
Earth Grounding of decoder systems requires planning and careful installation. Properly grounded decoder systems perform very well even in high-lightning regions. Poor grounding often results in unnecessary equipment losses and irrigation down time.

Earth grounding rules for the Hunter ACC2 decoder controllers are the same as conventional controllers as detailed above.

Decoder installations also require earth grounding in the two-wire path itself, to protect the decoder investment. The Hunter ICD family of decoders features integrated surge suppression and each decoder module is equipped with a bare copper wire for connection to earth ground hardware.

At the very minimum, the grounding circuit for decoders will include a copper ground plate and a 22.7kg bag of PowerSet® earth contact material, as defined below and per the following detail.

The copper grounding plate assemblies (Hydro Connect Part # HC-GP036) are to be made of a copper alloy intended for grounding applications and will have minimum dimensions of 100mm x 0.9m x 1.6mm (4" x 36" x 0.0625") a 3m (10 ft) continuous length of 5.3mm^2 (10AWG) insulated copper wire is to be attached to the plate using an approved welding process.

One (1) 22.7kg bag of PowerSet® (Hydro Connect Part # HC-GPSET) earth contact material must be spread so that it surrounds the copper plate evenly along its length within a 150mm (6") wide trench per detail below. Salts, fertilizers and other chemicals are not to be used in an attempt to improve soil conductivity because these materials are corrosive and will cause the copper conductors and electrodes to erode and become less effective with time.

Earth ground should be connected at every 12th Hunter ICD decoder or 330m (1000 ft) of wire run, whichever is shorter. The station size of the decoders is not taken into account for grounding purposes, every 12th decoder module is the rule.

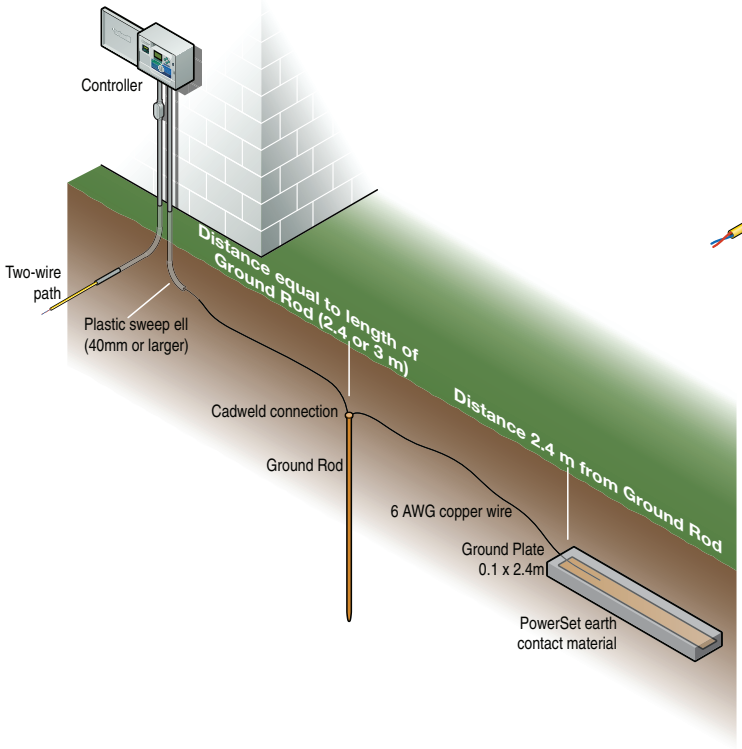
The final decoder in any wire run should be grounded. This includes the final decoders in each of the different arms of a "T".

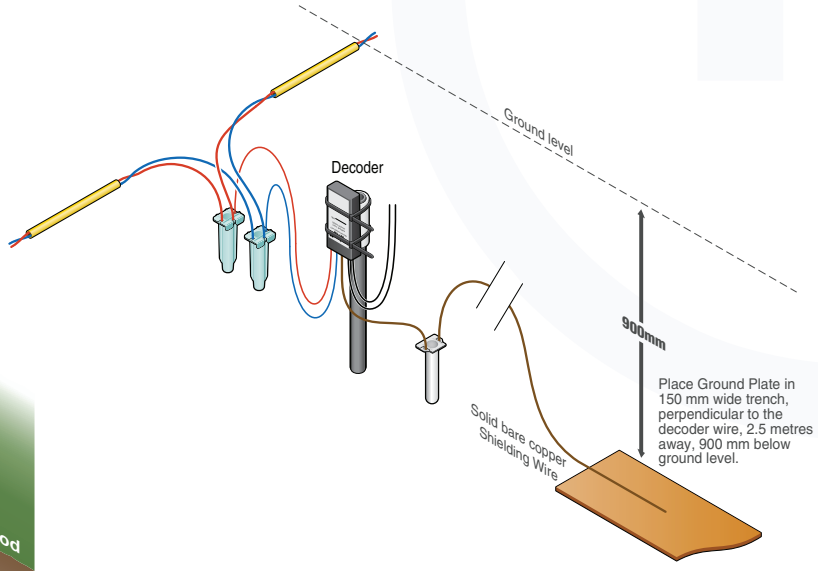
Ground wires on intervening Hunter ICD decoders are not used. It is not necessary to remove the unused ground wire or bury it. Simply fold them out of the way (this allows future additional grounding or use of the decoder in another location).

Decoder grounding hardware should always be connected and placed at right angles to the run of the two-wire path.

It is important that both the controller and the decoders are grounded to ground rods or plates with less than 10 Ohms resistance. The ground should always be measured with a ground resistance meter. The ground should be tested regularly for resistance.

Surge protection inside the decoder can wear out, and decoder should be replaced when they might have been damaged. The decoder is a complex electronic part and it is not possible to fully test whether it is working 100%. Replace the decoder if there is any visible damage to the device, or if nearby decoders or controllers have been damaged.





Notes:

1. If the wire path run is greater then 300M before the first decoder is installed, instal a Pilot SG to protect the long run of cable.
2. If the controller is mounted inside a building where it is not possible to connect a ground rod to the controller as the floor is all concrete, install a Pilot SG with grounding at the point outside the building where the field wires enter the building.