# EZ Decoder System (EZDS) Written Specifications

**Part 1 – General**

1. The irrigation control system shall feature a two-wire output module for two-wire decoder control of standard 24 VAC solenoid valves. The two-wire output module shall fit into a pre-existing module slot in the controller backplane and may coexist with “conventional” output modules. The field decoders are programmable and maximum wiring distances shall adhere to manufacturer specifications. An optional handheld, battery-powered diagnostic tool shall also provide wireless field diagnostic capabilities.

**Part 2 – Two-Wire Output Modules**

1. The two-wire output module shall be manufactured by the same manufacturer as the controller and shall carry all the same necessary approvals and compliance as the host controller.
	1. Output Module Characteristics - EZDM
		1. The two-wire output module is compatible with Hunter model HCC and ICC2 controllers.
		2. The maximum station count of the control system is 54, in any combination of conventional and decoder outputs.
		3. The two-wire output module shall not exceed 29 VAC (nominal 24 VAC) at 50 or 60 Hz, suitable for direct-burial wiring in landscape irrigation applications.
		4. The two-wire output module shall include two separate two-wire path screw terminals for wiring in different directions.
		5. The two-wire output module shall also permit operation of a Pump/Master Valve output via decoder in the two-wire path, if desired.
		6. The two-wire output module shall include a programming port and button for programming station addresses into the field decoders. The two-wire output module shall also include an LED light for programming and diagnostic purposes.
		7. The two-wire output module shall operate dedicated, programmable field decoders (EZ-1), manufactured by the same manufacturer as the controller and the two-wire output module, and specifically designed to operate as a complete system.
		8. The two-wire output module must be capable of operating two field decoders, plus a decoder-operated Pump/Master Valve output, simultaneously.
	2. Output Module Characteristics - PCDM
		1. The two-wire output module is compatible with Hunter model HPC and Pro-C controllers.
		2. The maximum station count of the control system is 28 decoders (if two-wire only), or 32 stations in a combination of conventional and decoder outputs.
		3. The two-wire output module shall not exceed 29VAC (nominal 24VAC) at 50 or 60 Hz, suitable for direct-burial wiring in landscape irrigation applications.
		4. The two-wire output module shall include one two-wire path terminal block for wiring in any direction.
		5. The two-wire output module shall also permit operation of a Pump/Master Valve output via decoder in the two-wire path, if desired.
		6. The two-wire output module shall include a programming port and button for programming station addresses into the field decoders. The two-wire output module shall also include an LED light for programming and diagnostic purposes.
		7. The two-wire output module shall operate dedicated, programmable field decoders (EZ-1), manufactured by the same manufacturer as the controller and the two-wire output module, and specifically designed to operate as a complete system.
		8. The two-wire output module must be capable of operating one field decoder, plus a decoder-operated Pump/Master Valve output, simultaneously.

**Part 3 – Field Decoders**

1. Decoder Characteristics – EZ-1
	1. The field decoders shall be completely waterproof, rated at IP68 for total immersion.
		1. Each field decoder shall be programmable with the desired station address and shall not require separate serial numbers of any kind.
		2. Each field decoder must include a waterproof status LED light to confirm programming and operations and serve as a field diagnostic aid.
	2. The programmable field decoders shall receive their station addresses from a programming port built into the two-wire output module or via handheld programmer.
	3. The field decoder output to the solenoid shall be 24 VAC, 50/60 Hz, and the output of an active station shall be measurable on a standard voltmeter or handheld programmer (EZDT).
		1. The wiring distance from the decoder to the solenoid shall be limited only by the total distance from the controller to the solenoid and the wire diameter, as indicated in the manufacturer’s wiring table.

**Part 4 – Wireless Diagnostic Tool**

1. An optional handheld, battery-powered diagnostic tool shall also be provided for wireless system diagnostics and troubleshooting.
	1. Diagnostic Tool Characteristics – EZDT
		1. The handheld diagnostic tool shall be capable of wireless communication with EZ-1 decoders without needing to remove decoders from the two-wire path.
		2. The diagnostic tool shall be capable of reading any individual decoder’s: station address, status, voltage on the two-wire path, and active current draw.
		3. The diagnostic tool shall provide wired station addressing and reprogramming of field decoders via the red and blue wires from an individual decoder.
		4. The diagnostic tool display shall be viewable in 12 different languages.
		5. The diagnostic tool shall be powered by 4 x AAA batteries.
		6. The diagnostic tool shall be provided with a MicroSD card reader for updating firmware versions of various EZ Decoder System components.

**Part 5 – Field Wiring**

1. The field decoders shall have color-coded wires to facilitate proper connection to the two-wire path and to the valve solenoid. There shall be no polarity on the two-wire path, which means it does not matter which path wire is connected to which incoming lead, and there shall be no polarity on the output wires to the 24VAC solenoid.
	1. All field decoder connections shall be made with gel-filled or similar waterproof splice connectors designed for standard in-ground landscape irrigation purposes.
	2. Wiring between the two-wire output module and the field decoders shall consist of direct-burial-rated standard irrigation wiring of an appropriate diameter for the maximum distances per the manufacturer’s specifications.
		1. Generally, American 14 AWG or international 2.5 mm2 are the preferred minimum sizes in professional installations, for tensile strength and longevity.
		2. Shorter runs may be achieved with smaller wires as indicated by the manufacturer’s recommendations.
	3. It is permissible, but not required, to run field wiring in plastic or metal conduit for resistance to pests.

**Part 6 – Earth Grounding**

1. The host controller shall be thoroughly earth grounded in accordance with the manufacturer’s specifications, ideally to a resistance of 10 ohms or less.
	1. The two-wire path does not require earth grounding or surge suppressors of any kind for typical installations.
	2. Compatible in-line surge arresting modules from the controller manufacturer may be added and grounded if specified.
		1. Compatible surge arresting modules shall be connected to 8' (2.5 m) copper-clad rods, or 100 mm x 1 m copper ground plates, and installed at least 8' (2.5 m) away from and at right angles to the two-wire path.
		2. Surge-arresting modules shall be connected to the two-wire path either in-line or at the far end of the two-wire path from the controller as specified.

**Part 7 – Models**

1. All components of the system shall have a three-year manufacturer’s warranty.
	1. The two-wire output modules shall be Hunter Industries Model EZ-DM (for HCC and ICC2 controllers) and PC-DM (for HPC and Pro-C controllers).
	2. The field decoders shall be Hunter Industries Model EZ-1.
	3. The wireless diagnostic tool shall be Hunter Industries Model EZ-DT
	4. Compatible surge arrestors shall be Hunter Industries Model DUAL-S.