Rain Bird® 2-Wire Control Systems

Decoder irrigation systems offer unmatched expandability, easy installation and lower costs.
History

Rain Bird pioneered 2-wire technology, refined it in Europe, and has been offering it in the United States as a viable alternative to conventional irrigation control for two decades.

Thousands of sites all over the world use Rain Bird 2-wire systems in golf courses, country clubs, municipal median strips, malls, corporate and college campuses and residential developments.

Simple installation and low-cost wiring make decoders an aesthetically pleasing and economical option for reliable in-field control.

Rain Bird® 2-Wire Control Systems

Install state-of-the-art decoder-based control.

Changes to scope, budget and future site expansion are not uncommon during large commercial and industrial site construction. Because these changes are the norm (not the exception), designers, specifiers and contractors want a central irrigation control system that can handle flexibility while keeping costs down.

If this sounds like your situation, a Rain Bird 2-wire decoder-based control system might be the right solution for you. Decoders are essentially simple and reliable switching stations that work like conventional controller station outputs, except they are installed in the valve box along with the individual valves.

2-wire Maxi-Cable connects the MDC 2 controller and decoders, providing control of up to 200 addresses. A single wire path keeps wire costs to a minimum and simplifies installation.

2-wire control systems are easy to expand as your site grows and changes, and can be upgraded to full central control functionality with a Rain Bird SiteControl system, managing up to 4,000 decoder addresses over a huge site.

“With only a single wire path, wire costs are kept to a minimum and installation is simplified.”
Components of a 2-Wire System

MDC 2 Controller
A Rain Bird 2-wire control system has two major components: a controller (like the Rain Bird MDC 2) or controller interface and a system of decoders.

Decoder Family
Rain Bird decoders (such as the FD-401) are small, weatherproof “switching stations” that accept and decode multiplexed electrical signals. They’re typically installed in valve boxes with valves and wiring, safe from weather conditions, animals and vandals. Decoders, like an apartment complex, have a set of fixed addresses (up to 6). An address is an exclusive connection to a valve or another device on a 2-wire path.

Maxi-Cable
Connecting the controller to the decoders is a pair of 14-gauge Maxi-Cable wires—the heart of the 2-wire system—that passes voltage and information to and from the components. Decoders, the controller, and other components work hand-in-hand, connected by the 2-wire strand.

Sensors
Other components in a Rain Bird 2-wire irrigation system can include sensors, such as rain or flow sensors. Strategically placed on the 2-wire path, Rain Bird flow and rain sensors send data to the MDC 2 controller for precise and accurate control.

Surge Protectors
A critical component of the 2-wire system, Rain Bird surge protectors decrease the risk of damage from electrical surges on the two-wire communication path. To maximize protection, Rain Bird recommends installing surge protectors at 500-foot intervals along the 2-wire path.

Wiring a Decoder is Fast and Easy
Rain Bird recommends using 3M (Direct Bury) DBY/DBR “grease pack” connectors when wiring from Maxi-Cable to decoders and solenoids. This ensures wire connections stay insulated and secure against the elements.

Expansion Made Easy
Even when an irrigation installation is complete, you know it’s not really finished. Construction projects like business parks, phased housing developments, and shopping centers are designed with future expansion in mind—landscape and irrigation design should be approached the same way.

Job sites that require expansion or phased construction are a perfect fit for a Rain Bird 2-wire control system. If you have an established common-wire system, adding just one valve means digging a trench all the way back to the controller. That’s time-consuming and disruptive at sites already open to the public. But a decoder-based system means you just splice into the existing 2-wire path, add decoders, program the controller, and let the system do the rest of the work.

Using a Rain Bird MDC 2 controller gives you up to 200 individual decoder addresses. For even larger single sites, you don’t have to coordinate between multiple controllers. Install Rain Bird SiteControl and either LDI or SDI interfaces, and you can manage up to 4,000 addresses with the same degree of flexibility.

SiteControl Decoder Systems

![Diagram showing a Rain Bird MDC 2 controller, decoders, 2-wire Maxi-Cable, surge protector, and ground rod.]

- **Central Controller**

- **SDI** (200 Decoder Addresses)

- **LDI** (500 Decoder Addresses)

- Decoders

- Decoders

- 2-Wire Maxi-Cable

- Connector

- Ground Rod

- Valve

- Decoder

- Surge Protector

The Intelligent Use of Water™
THE FIELD OF DREAMS, Wauson, Ohio

This state-of-the-art athletic complex needed an efficient, smart irrigation plan to keep everything green and well-watered. The designers knew that the best way to reduce wire runs and maximize future expansion flexibility was to use a Rain Bird 2-wire decoder-based system throughout the complex. With a 2-wire design, designers took the place of thousands of feet of wire, vastly simplifying installations and making future expansion much easier.

**Benefits Overview**

For the Field of Dreams site, making the decision to go with a 2-wire solution was easy:

<table>
<thead>
<tr>
<th>2-Wire</th>
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<tbody>
<tr>
<td>Less cost</td>
<td>✓</td>
</tr>
<tr>
<td>Less wiring</td>
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<tr>
<td>Less labor</td>
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<tr>
<td>Greater flexibility</td>
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<tr>
<td>Easier troubleshooting</td>
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<tr>
<td>Vendor-resistant</td>
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<tr>
<td>Expandable to Rain Bird SiteControl</td>
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**Did You Know?**

- Rain Bird decoders have 1, 2, 4, or 6 addresses, depending on the model. Different models can operate 1, 2, 4 or 6 valves, and some can operate pairs of valves from a single address.
- 14-gauge Maxi-Cable runs can be up to 2.4 miles in a star pattern. For longer runs, you can loop the Maxi-Cable back to the controller and stretch your run up to 8 miles.
- Rain Bird recommends installing LSP-1TUB line surge protectors every 500 feet on a 2-wire path. Rain Bird FD-401 and FD-601 decoders feature built-in surge protection and a grounding wire, which eliminates the need for additional surge protectors.
- Poor splicing techniques cause 98% of field wiring problems. Avoid using pocket knives, utility knives or Romex strippers to strip Maxi-Cable.
- Prior to splicing in the next length of wire, check each length for continuity and resistance to ground. Rain Bird recommends using 3M 8500/DBR "grease packs" at every splice location.
- When splicing, Rain Bird recommends leaving 18"-24" slack above grade. This allows easy access for future troubleshooting.
- Rain Bird's MDC 2 Controllers come with free programming software that on average can cut your set-up time by 75%.
- The optional Rain Bird Freedom handheld remote allows you to start, stop and control individual decoders or complete programs from any location on your 2-wire site.

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A 2-wire installation can save up to 80% in wiring costs over a conventional system.

**The Field of Dreams - 2-Wire Layout**
Testimonials

David Eldridge  
Assistant Manager, City of Greenville (Falls Park)  
“We needed an irrigation controller that could handle more than 50 zones. I also wanted to be able to control the system from my office, and Rain Bird's MDC controller and 2-wire system lets me do that. Since we are a public park location, we’re not allowed to water during the day, but the combination of Rain Bird decoders and the MDC controller lets me maximize system hydraulics to better manage water windows. Greenville uses nothing but Rain Bird products, and our relationship with our local rep means we get great service, training, and support whenever we need it.”

Roger Norberg  
Central Control Service Manager Distributor, Western Supply  
“We've been selling and supporting Rain Bird decoder-based irrigation systems since mid-2003. Our commercial projects range from subdivisions to nurseries, strip malls, ranches and school districts.

Two-wire technology can be appealing for sites with long wire runs, extensive slewing or phased projects. Two-wire decoder systems negate the need for multiple common wires, spares and future phase guesswork. Using one primary wire pair, installation costs are considerably less. After the install is complete, the static nature of decoders in the field takes the guesswork out of repairing multiple commons and primary wires, and repairs only take a fraction of the time. This gets a system back up and watering fast.

Rain Bird 2-wire designs also allow us to take future expansion into consideration, which keeps costs down for developers.

We're seeing exponential growth in demand for 2-wire systems. In 2003 we had sold two decoder-based sites. To date we have sold 25, with an additional eight to ten more spec’d for this year. Now that our local guys understand the benefits and reliability of a 2-wire decoder system, they are quick to recommend it to new and existing customers.

The Intelligent Use of Water™ — Visit www.rainbird.com to learn about our efforts