

# Irrigander<sup>®</sup> 8 Pro Expander

## 8 Zone Irrigation Expander

### Installation & User Guide

#### Model 8ZEXS V1.0



**Irrigander® 8 Pro Expander**  
**8 Zone Irrigation Expander**

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# **Irrigander<sup>®</sup> 8 Pro Expander**

## **8 Zone Irrigation Expander**

### **Introduction**

Congratulations on your purchase of the **Irrigander 8 Pro** irrigation expander! The **Irrigander 8 Pro** expander is an 8 zone expander that allows you to control additional irrigation valves without adding new field wiring. It uses state of the art technology to control 8 valves using just 2 field wires (one dedicated field wire and the shared system common connection). Our proprietary **Irrigander 2-wire Technology** is designed specifically for high reliability in retrofit installations. This makes it simple to add additional zones to any irrigation system with available outputs on the irrigation controller.

The **Irrigander 8 Pro** expander operates transparently to the irrigation controller. The valves connected to the **Irrigander 8 Pro** expander's Decoder run and operate normally.

Each of the valves controlled by the **Irrigander 8 Pro** expander can be individually tested for easy system maintenance. The **Irrigander 8 Pro** expander generates full power to drive each valve so maximum reliability is achieved with both old and new valves. The **Irrigander 8 Pro** expander Decoder is built to rugged industrial standards and is sealed to provide long life and high reliability in any environment.

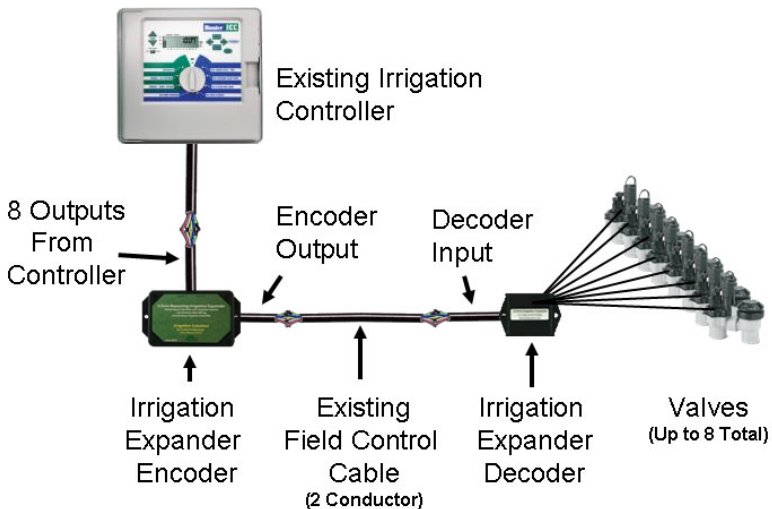
Please read the following information and installation instructions completely before starting the installation.

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### Overview

The **Irrigander 8 Pro** expander is comprised of two modules: an Encoder that is installed close to or inside the irrigation controller; a Decoder that are installed close to the irrigation valves to be controlled. The Encoder attaches to the Irrigation Controller using 10 wires: Zone 1 input; Zone 2 input; Zone 3 input; Zone 4 input; Zone 5 input; Zone 6 Input; Zone 7 Input; Zone 8 Input; Common; and 24 VAC. The Encoder is attached to the Decoder using 2 wires: a field control wire; the system common wire. These wires are typically the existing field control wires in the irrigation system to be expanded. The decoder has 8 output wires that are attached to each of the up to 8 valves to be controlled. See Figure 1 for a typical installation.



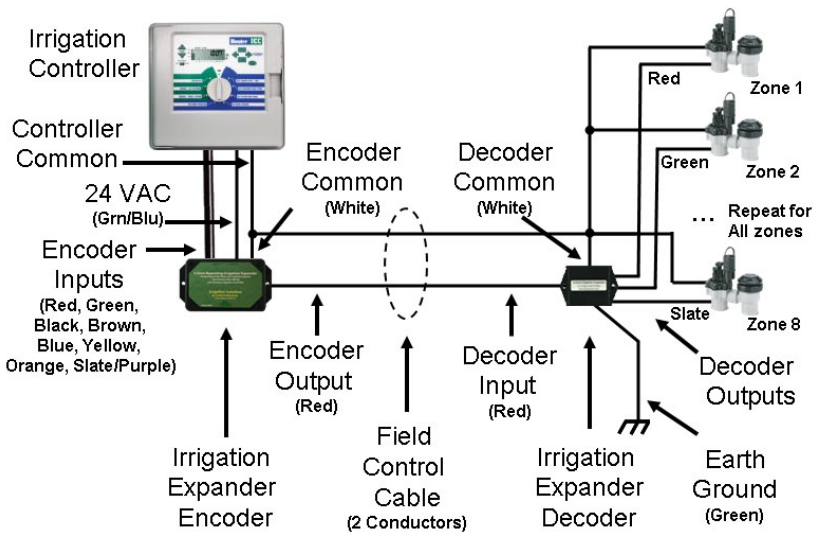
**Figure 1 – Typical Installation**

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### Installation Instructions

Please read these instructions completely before starting the installation. Refer to the schematic diagram in Figure 2 for wiring details.



**Figure 2 – Installation Schematic Diagram**

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### Installing the Encoder

1. Mount the Encoder (the Encoder is the module with the green label) close to the irrigation controller. If the irrigation controller is mounted outdoors the Encoder must be mounted in a weatherproof enclosure. Mount the Encoder such that it can be accessed for service in case an overload causes the protection fuse to open.
2. The Encoder “Cable A” wires are listed in Table 1. The color coding may vary depending on the particular cable used in the manufacture of the Encoder. Connect the 8 zone inputs on the Encoder to 8 unused outputs on the irrigation controller.

Wire Color	Use
Red	Zone 1 input
Green	Zone 2 input
Black	Zone 3 input
Brown	Zone 4 input
Blue	Zone 5 input
Yellow	Zone 6 input
Orange	Zone 7 input
Slate or Purple	Zone 8 input

**Table 1 - Encoder “Cable A” Color Coding**

3. The Encoder “Cable B” wires are listed in Table 2. The color coding may vary depending on the particular cable used in the manufacture of the Encoder:

Wire Color	Use
Red	Encoder Output
Green or Blue	24 VAC
White	Common

**Table 2 - Encoder “Cable B” Color Coding**

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4. Disconnect a field control wire from the irrigation controller for one of the valves in the location where the new valves will be installed and connect it to the Encoder output (“Cable B” Red) using a twist-on wire connector. Remember the color code on this field wire; it will be connected to the Decoder at the valves to be expanded in *“Installing the Decoder”*.
5. Connect the Common on the Encoder (“Cable B” White) to any of the common points on the irrigation controller.
6. Remove power from the irrigation controller. Attach the 24 VAC input (“Cable B” Green or Blue) to the Encoder to one side of the 24 VAC transformer in the irrigation controller. Restore power to the irrigation controller. The LED on the front of the Encoder should light momentarily and then go off. If the LED does not light, remove power from the irrigation controller and connect the 24 VAC input to the Encoder to the other side of the 24 VAC transformer in the irrigation controller. Restore power to the irrigation controller.

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### Installing the Decoder

1. Install the Decoder close to the valves to be controlled. The Decoder is very rugged and can be buried close to the valves or installed in a valve box. While the Decoder will operate under water it is best to install the Decoder where it will not be continuously under water.
2. The wires identified on the Decoder as “Cable B” are listed in Table 3. The color coding may vary depending on the particular cable used in the manufacture of the Decoder:

Wire Color	Use
Red	Decoder Input
Green or Blue	Earth Ground
White	Common

**Table 3 - Decoder “Cable B” Color Coding**

3. Connect the Common on the Decoder (“Cable B” White), the field common wire (this is typically a white wire), and one solenoid wire from each of the valves to be controlled together using a waterproof wire connector (e.g. DryConn<sup>®</sup> Waterproof Connector).
4. Connect the Decoder input (“Cable B” Red) to the field wire used in Step 4 of “*Installing the Encoder*” using a waterproof wire connector.

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5. Connect each of the Decoder outputs to the second solenoid wire from each of the valves to be controlled using a waterproof wire connector. Note that these valves can be any combination of existing valves or newly added valves up to a maximum of 8. See Table 4 for the color coding of each of the Decoder outputs. The color coding may vary depending on the particular cable used in the manufacture of the Decoder:

Wire Color	Use
Red	Zone 1 output
Green	Zone 2 output
Black	Zone 3 output
Brown	Zone 4 output
Blue	Zone 5 output
Yellow	Zone 6 output
Orange	Zone 7 output
Slate or Purple	Zone 8 output

**Table 4 - Decoder “Cable A” Color Coding**

6. Connect the Earth Ground (“Cable B” Green or Blue) to a suitable earth ground. The Earth Ground connection is optional but a good Earth Ground will improve the Decoder’s surge protection. See “*Surge Protection*” for more details on properly grounding the Decoder.

Installation is complete! Test all zones by cycling the outputs from the irrigation controller connected to the **Irrigander 8 Pro** expander.

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### **Surge Protection**

Just like any other field installed electronic device, surge protection is vital to the reliable operation of the **Irrigander 8 Pro** expander. The Decoder and the Encoder use metal oxide varistor (MOV) surge suppression technology to minimize the potential damage from lightning and other electrical surges. While optional, the following steps will greatly improve the system's surge protection:

1. Make sure the irrigation controller is properly grounded. See the irrigation controller's installation manual for instructions applicable to your controller. Irrigation controllers installed outside must be grounded per the requirements of the National Electrical Code and local ordinances.
2. Install an **Irrigander Surge Suppressor** (sold separately) every 300 feet on the two field wires between the **Irrigander 8 Pro** expander's Encoder and Decoder for field wire lengths longer than 300 feet.
3. If a metal pipe is available at the Decoder location, connect the Earth Ground ("Cable B" Green or Blue) to the metal pipe using a suitable grounding clamp. Do not put more than one wire under the clamp.
4. If a suitable ground is not present at the Decoder location, install an 8' copper clad ground rod (not included) close to the Decoder. Connect the Earth Ground ("Cable B" Green or Blue) from the Decoder to the ground rod using a copper clamp. Do not put more than one wire under the clamp.

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### **Operating the Irrigander 8 Pro Expander**

The information below describes the various operating modes of the **Irrigander 8 Pro** expander.

#### **Idle**

While the **Irrigander 8 Pro** expander is waiting for input from the irrigation controller the LED on the front of the Encoder will blink briefly once every 10 seconds. This indicates that the Encoder is functioning correctly and that a timing cycle has not yet started.

#### **Running a Cycle on Zones 1 through 8**

When the irrigation controller activates any of the zone inputs on the **Irrigander 8 Pro** expander the LED on the Encoder will turn on and the corresponding Zone 1 to Zone 8 will run.

#### **Testing Zones 1 through 8**

Since operation of the **Irrigander 8 Pro** expander is transparent to the irrigation controller, each valve connected to the Decoder can be cycled by activating the corresponding zone output on the irrigation controller. The LED on the Encoder will turn on and the corresponding Zone 1 to Zone 8 will run.

#### **Encoder/Decoder Communications**

The **Irrigander 8 Pro** expander's Encoder communicates with the Decoder during the operation of a timing cycle. If this communications fails, the LED on the Encoder will blink rapidly to indicate the failure. If this occurs, see the "*Troubleshooting*" later in this User Guide for steps to correct the problem.

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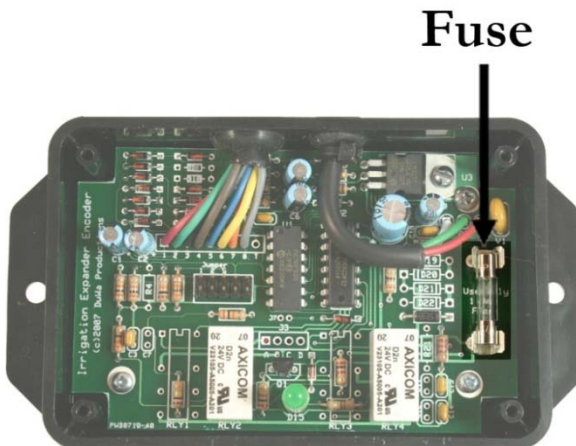
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### Replacing the Encoder Fuse

The **Irrigander 8 Pro** expander Encoder is equipped with a protection fuse that will open in case of overload in one of the valve circuits. To replace the fuse:

1. Remove power from the irrigation controller
2. Remove the 4 screws on the front cover of the Encoder and remove the cover. Be careful not to bend the LED as you remove the cover.
3. Remove the old fuse and replace with a fuse of identical rating (1 amp, 5mm x 20mm). See Figure 2 below for the fuse location.
4. Replace the cover on the front of the Encoder.
5. Restore power to the irrigation controller

The fuse is a standard size and is commonly available but if you have difficulty locating a source for a replacement fuse, email us at [support@irrigander.com](mailto:support@irrigander.com).



**Figure 2 – Fuse Location**

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### Troubleshooting

Problem	Cause	Solution
The Irrigation Controller will not turn on any valves connected to the Irrigander 8 Pro expander, other zones work OK	Improper irrigation controller connections	Double check wiring of “Cable A” and “Cable B” to the Encoder
	Short circuit or overload has opened the protection fuse in the Encoder	Diagnose the short circuit or overload and correct. Replace fuse according to directions in “ <i>Replacing Encoder Fuse</i> ”.
LED on the front of the Encoder blinks rapidly	Communications has been lost between the Encoder and the Decoder	Make sure that the field cable wires connected between the “Cable B” on the Encoder and “Cable B” on the Decoder are still OK. Once a connection issue has been repaired, run a cycle on any zone to clear the error.
LED on front of Encoder does not blink when Idle	Short circuit or overload has opened the protection fuse in the Encoder.	Diagnose the short circuit or overload and correct. Replace fuse according to directions in “ <i>Replacing Encoder Fuse</i> ”
	Encoder does not have 24 VAC input	Double check wiring of 24 VAC. Move 24 VAC input to other side of 24 VAC transformer in the irrigation controller

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### Specifications

#### Expansion Capability

The **Irrigander 8 Pro** expander can control up to 8 zones. See Table 4 for expansion capability depending on the number of field wires available:

Wires to Valves <sup>1</sup>	2	3	4
# Valves w/out Expander	1	2	3
# Valves w/Irrigander 8 Pro	8	16 <sup>2</sup>	24 <sup>3</sup>

**Table 4 – Expansion Capability**

Notes:

- <sup>1</sup> One wire is the system common
- <sup>2</sup> Using 2 **Irrigander 8 Pro** expanders
- <sup>3</sup> Using 3 **Irrigander 8 Pro** expanders

#### Physical Dimensions

	Width	Height	Depth
Encoder	5.1"	2.9"	1.1"
Decoder	4.0"	3.1"	1.0"

**Table 5 – Dimensions**

Note that the width dimensions include mounting flanges.

#### Power Requirements

- 24 -30 VAC provided by irrigation controller
- Power: idling 0.3 watt, operating: 1.0 watt max

#### Valves per Zone

Each output from the **Irrigander 8 Pro** expander's Decoder can drive 1 or 2 valves. Connecting more than 2 valves to any single output may cause improper operation and may cause the protection fuse to open in the Encoder.

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### **Supported Irrigation Valves**

Any 24 VAC solenoid activated irrigation valve can be used. DC low voltage valves should not be used.

### **Supported Irrigation Controllers**

Virtually any irrigation controller that uses 24 VAC valves and a common connection on the output can be used.

### **Operating Range**

The **Irrigander 8 Pro** expander Decoder can be located up to 850 feet from the Encoder using 18 gauge field wiring or 2000 feet using 14 gauge field wiring. The valves to be controlled can be up to 100 feet from the Decoder using 18 gauge wiring.

### **Simultaneous Active Zones**

The **Irrigander 8 Pro** expander can only have one output active at a time. If more than one input from the irrigation controller is active, the **Irrigander 8 Pro** expander will only activate one output zone.

### **Encoder Environmental Specifications**

Operating: 0°C to +50°C (+32°F to +122°F)

Non-Operating: -40°C to +70°C (-40°F to +158°F)

The Encoder is not waterproof; enclose the Encoder unit in a suitable weather proof enclosure if installed outdoors.

### **Decoder Environmental Specifications**

Operating: -20°C to +50°C (-4°F to +122°F)

Non-Operating: -40°C to +70°C (-40°F to +158°F)

The Decoder is designed for harsh environments and is suitable for most outdoor conditions including wet environments. However the decoder should not be placed where it is operated continuously under water.

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## **Limited Warranty**

DUWA PRODUCTS LLC, hereinafter referred to as the manufacturer, warrants the **Irrigander 8 Pro Expander** to be free from defects in workmanship and materials for 1 (one) year from the date of sale. In order for this warranty to apply the **Irrigander 8 Pro Expander** must be installed and used according to the installation instructions herein and cannot be altered in any way. This warranty covers damage from electrical surge (including lightning) providing that the **Irrigander 8 Pro Expander** is installed with a suitable earth ground as described herein. The use of the **Irrigander 8 Pro Expander** for any purpose for which it was not intended voids this warranty. Purchaser's rights under this warranty shall consist solely of requiring manufacturer to repair, or in manufacturer's sole discretion replace, free of charge, F.O.B. factory, any defective items received at said factory within 1 (one) year and determined by manufacturer to be defective. To exercise your warranty, return the unit to your dealer with a copy of the sales receipt.

This warranty is in lieu of all other warranties, expressed, implied, or statutory as to merchantability, fitness for purpose sold, description, quality, or any other matter and limits the manufacturer's liability for damages to the cost of the product. In no event shall manufacturer be liable for special or consequential damages or for delay in performance of this warranty. This warranty gives the purchaser specific legal rights, and the purchaser may have other rights, which vary from state to state.

### **How to Contact us:**

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