

# Irrigander<sup>®</sup> 8 Expander

## 8 Zone Irrigation Expander

### Installation & User Guide

#### Model 8ZEX V2.0



**Irrigander<sup>®</sup> 8 Expander**  
**8 Zone Irrigation Expander**

**Table of Contents**

<b>Introduction.....</b>	<b>1</b>
<b>Overview .....</b>	<b>2</b>
<b>Installation Instructions .....</b>	<b>3</b>
Installing the Encoder .....	3
Installing the Decoder .....	6
<b>Operating the Irrigander 8 Expander .....</b>	<b>8</b>
Idle .....	8
Running a Cycle on Zones 1 through 8 .....	8
Testing Zones 1 through 8 .....	8
<b>Replacing the Encoder Fuse.....</b>	<b>9</b>
<b>Troubleshooting Guide.....</b>	<b>10</b>
<b>Specifications .....</b>	<b>11</b>
Expansion Capability .....	11
Physical Dimensions .....	11
Power Requirements .....	11
Supported Irrigation Controllers .....	12
Supported Irrigation Valves.....	12
Valves per Zone .....	12
Simultaneous Active Zones .....	12
Encoder Environmental .....	12
Decoder Environmental.....	12
<b>Limited Warranty .....</b>	<b>13</b>

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

## **8 Zone Irrigation Expander**

### **Introduction**

Congratulations on your purchase of the **Irrigander 8** irrigation expander! The **Irrigander 8** expander is an 8 zone expander that allows the addition of irrigation zones without adding new field wiring. It uses a state of the art microcontroller to control up to 8 valves using just 4 field wires. This makes it simple to add additional zones to any irrigation system with unused outputs on the irrigation controller.

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

Each of the valves controlled by the **Irrigander 8** expander can be individually tested for easy system maintenance. The **Irrigander 8** expander puts a minimal load on each irrigation controller output to maximize the reliability of the controller. The **Irrigander 8** expander is designed to have all sensitive electronics in the Encoder, safe from water and weather. The Decoder is sealed and is built to rugged industrial standards to provide long life and high reliability in any environment.

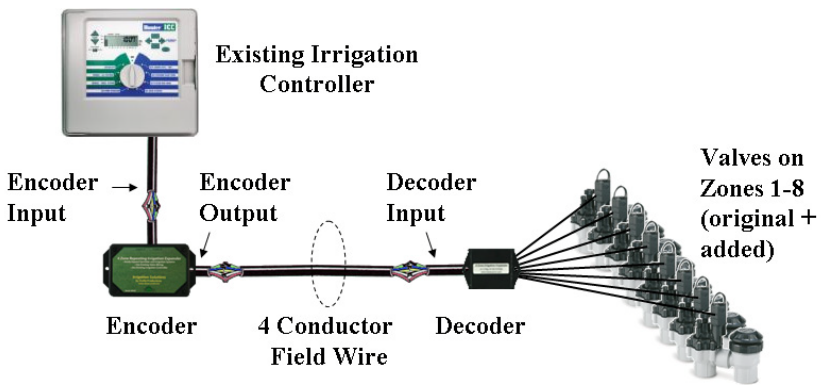
Please read the following information and installation instructions completely before starting the installation.

# Irrigander<sup>®</sup> 8 Expander

## 8 Zone Irrigation Expander

### Overview

The **Irrigander 8** 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 1, 2, or 3 wires plus 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 and a common 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**

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

## **8 Zone Irrigation Expander**

### **Installation Instructions**

The **Irrigander 8** expander can be installed to drive 2, 4, or 8 zones depending on the number of field wires available. The instructions below show the different installation configurations. Please read these instructions completely before starting the installation.

#### **Installing the Encoder**

1. Mount the Encoder (the larger of the two modules) 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. Disconnect the field wires on the irrigation controller outputs that correspond to the valves to be expanded. The wires identified on the Encoder as “Cable A” connect to the irrigation controller. Connect the Zone Inputs on the Encoder to unused outputs on the irrigation controller. The zone inputs are different depending on the number of zones being driven. See Table 1 for the color coding of the Encoder wires connected to the irrigation controller.

Note that the color coding on the Encoder and Decoder cables may vary depending on the particular cable used in the manufacture of the modules. However the color coding on the Encoder and the Decoder will be the same.

## Irrigander<sup>®</sup> 8 Expander 8 Zone Irrigation Expander

### Encoder “Cable A” Color Coding

Wire Color	8 Zones	4 Zones	2 Zones
White	Common	Common	Common
Red	Zone 1 input	Zone 1 input	Zone 1 input
Green	Zone 2 input	Zone 2 input	Not Used
Black	Zone 3 input	Zone 3 input	Zone 2 input
Brown	Zone 4 input	Zone 4 input	Not Used
Blue	Zone 5 input	Not Used	Not Used
Yellow	Zone 6 input	Not Used	Not Used
Orange	Zone 7 input	Not Used	Not Used
Slate	Zone 8 input	Not Used	Not Used
Pink or Purple	24 VAC	24 VAC	24 VAC

**Table 1**

3. Connect the Common on the Encoder to any of the common points on the irrigation controller.
4. Remove power from the irrigation controller. Attach the 24 VAC input (Pink or Purple wire) 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.
5. The wires identified on the Encoder as “Cable B” connect to the Decoder through the field wires. Attach the Encoder outputs on “Cable B” to the field wires disconnected from the irrigation controller in step 2 using twist-on wire connectors. Record the color of each wire used in Table 2, 3, or 4 depending on the number of zones being used.

**Irrigander<sup>®</sup> 8 Expander**  
**8 Zone Irrigation Expander**

**8 Zone Encoder/Decoder Cable “B” Color Coding**

Wire Color	Wire Use	Field Cable Wire Color
Red	Output/Input 1	
Green	Output/Input 2	
Black or Blue	Output/Input 3	

**Table 2**

**4 Zone Encoder/Decoder Cable “B” Color Coding**

Wire Color	Wire Use	Field Cable Wire Color
Red	Output/Input 1	
Green	Output/Input 2	
Black or Blue	Output/Input 3	Not Used

**Table 3**

**2 Zone Encoder/Decoder Cable “B” Color Coding**

Wire Color	Wire Use	Field Cable Wire Color
Red	Output/Input 1	
Green	Output/Input 2	Not Used
Black or Blue	Output/Input 3	Not Used

**Table 4**

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## 8 Zone Irrigation Expander

### 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. Disconnect all of the valve wires from the field cable connections used in step 5 of “*Installing the Encoder*” (Table 2). Disconnect these valves from the common connection.
3. The wires identified on the front of the Decoder as “Cable B” connect to the Encoder through the field wires. Match the Decoder input wire colors on the Decoder’s “Cable B” to the field cable wire colors that were connected to the “Cable B” Encoder outputs in step 5 of “*Installing the Encoder*” (Table 2, 3, or 4). The color coding on the Decoder “Cable B” inputs is the same as the color coding on the Encoder “Cable B” outputs. Connect the Decoder inputs to the field wires connected to the Encoder outputs using waterproof wire connectors (e.g. DryConn<sup>®</sup> Waterproof Connector). **The wires from the Decoder must be attached to the correct wires in the field cable that are attached to the Encoder for proper operation.**
4. Connect the “Cable B” White wire (depending on the cable used in manufacturing this wire may also be Brown or Yellow) to the system common connection from the irrigation controller (typically a white wire) using a waterproof wire connector.
5. Connect one side of all the valves to be controlled by the Decoder together and to the white “Output Common” wire on the Decoder using a waterproof wire connector (e.g. DryConn<sup>®</sup> Waterproof Connector). Connect each of the

## Irrigander<sup>®</sup> 8 Expander 8 Zone Irrigation Expander

Decoder outputs to the other wire on each of the valves to be controlled using a waterproof wire connector (see Table 5). Unused outputs on the Decoder should be insulated.

**Decoder “Cable A” Color Coding**

<b>Wire Color</b>	<b>8 Zones</b>	<b>4 Zones</b>	<b>2 Zones</b>
White	Common	Common	Common
Red	Zone 1 output	Zone 1 output	Zone 1 output
Green	Zone 2 output	Zone 2 output	Not Used
Black	Zone 3 output	Zone 3 output	Zone 2 output
Brown	Zone 4 output	Zone 4 output	Not Used
Blue	Zone 5 output	Not Used	Not Used
Yellow	Zone 6 output	Not Used	Not Used
Orange	Zone 7 output	Not Used	Not Used
Slate/Purple	Zone 8 output	Not Used	Not Used

**Table 5**

Note that the “Cable B” White (common) wire is connected to the “Cable A” White (common) wire inside the Decoder.

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

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

## **8 Zone Irrigation Expander**

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

The information below describes the various modes and features of the **Irrigander 8** expander.

#### **Idle**

While the **Irrigander 8** 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** 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** expander is transparent to the irrigation controller, each valve connected to the Decoder can be cycled by manually 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.

# Irrigander<sup>®</sup> 8 Expander

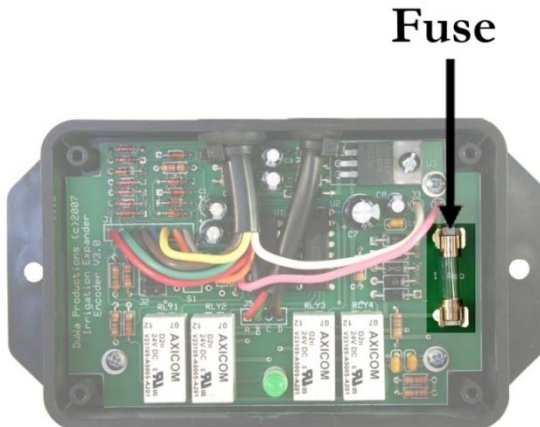
## 8 Zone Irrigation Expander

### Replacing the Encoder Fuse

The 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**

# Irrigander<sup>®</sup> 8 Expander

## 8 Zone Irrigation Expander

### Troubleshooting Guide

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
The Irrigation Controller will not turn on any valves connected to the Irrigander 8 expander, other zones work OK	Improper irrigation controller connections	Double check wiring of “Cable A” 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> ”.
The Irrigation Controller can control some valves attached to the Irrigander 8 expander but not all.	“Cable B” mis-wired at the Encoder or Decoder	Make sure that the field cable wires connected to “Cable B” on the Encoder and Decoder “Cable B” match.
Valve activation does not match zone programming on the irrigation controller	Multiple zones are operating at the same time	Reprogram the irrigation controller to only allow one zone connected to an Irrigander 8 expander to operate at a time.
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

# Irrigander<sup>®</sup> 8 Expander

## 8 Zone Irrigation Expander

### Specifications

#### Expansion Capability

The **Irrigander 8** expander can control up to 8 zones. See Table 6 for expansion capability based on the number of field wires available:

Wires to Valves <sup>1</sup>	2	3	4	5	6	7
# Valves w/out Expander	1	2	3	4	5	6
# Valves w/Irrigander 8	2	4	8	9 <sup>2</sup>	10 <sup>3</sup>	16 <sup>4</sup>

**Table 6**

Notes:

- <sup>1</sup> One wire is the system wide common
- <sup>2</sup> 3 field wires connected to **Irrigander 8** expander, 1 Field Wire connected directly to valve, all valves connected to shared common
- <sup>3</sup> 3 field wires connected to **Irrigander 8** expander, 2 field wires connected directly to 2 valves, all valves connected to shared common
- <sup>4</sup> Using 2 **Irrigander 8** expanders

#### Physical Dimensions

	Width	Height	Depth
Encoder	5.1"	2.9"	1.1"
Decoder	4.0"	2.0"	0.9"

Note that the width dimensions include mounting flanges.

#### Power Requirements

- 24-30 VAC provided by the irrigation controller
- Power consumption: idling 0.3 watts; operating: 1.5 watt max

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

## **8 Zone Irrigation Expander**

### **Supported Irrigation Controllers**

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

### **Supported Irrigation Valves**

Virtually any 24 VAC irrigation valve can be used with the **Irrigander 8** expander.

### **Valves per Zone**

Each output from the **Irrigander 8** expander Decoder is designed to drive a maximum of one valve.

### **Simultaneous Active Zones**

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

### **Encoder Environmental**

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**

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.

# Irrigander® 8 Expander

## 8 Zone Irrigation Expander

### Limited Warranty

DUWA PRODUCTS LLC, hereinafter referred to as the manufacturer, warrants the **Irrigander 8 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 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 Expander** is installed with a suitable earth ground as described herein. The use of the **Irrigander 8 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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