

Irrigander[®] 8/2 Pro Expander

8 Zone Irrigation Expander

Installation & User Guide

Model 8ZEXT V1.0



Irrigander[®] 8/2 Pro Expander
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Table of Contents

Introduction.....	1
Overview	2
Installation Instructions	3
Installation Options	3
Installing the Encoder	5
Installing the Decoders	7
Surge Protection	9
Operating the Irrigander 8/2 Pro Expander.....	10
Idle	10
Running a Cycle on Zones 1 through 8	10
Testing Zones 1 through 8	10
Encoder/Decoder Communications.....	10
Replacing the Encoder Fuse.....	11
Troubleshooting.....	12
Specifications	13
Expansion Capability	13
Physical Dimensions	13
Power Requirements	13
Valves per Zone	13
Supported Irrigation Valves.....	14
Supported Irrigation Controllers	14
Operating Range	14
Simultaneous Active Zones	14
Encoder Environmental Specifications	14
Decoder Environmental Specifications	14
Limited Warranty	15

Irrigander[®] 8/2 Pro Expander

8 Zone Irrigation Expander

Introduction

Congratulations on your purchase of the **Irrigander 8/2 Pro** irrigation expander! The **Irrigander 8/2 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. The **Irrigander 8/2 Pro** expander includes 4 two zone decoders to drive 8 valves in up to 4 different locations. This makes it simple to add additional zones to any irrigation system with available outputs on the irrigation controller.

The **Irrigander 8/2 Pro** expander operates transparently to the irrigation controller. The valves connected to the **Irrigander 8/2 Pro** expander's Decoder run and operate normally.

Each of the valves controlled by the **Irrigander 8/2 Pro** expander can be individually tested for easy system maintenance. The **Irrigander 8/2 Pro** expander generates full power to drive each valve so maximum reliability is achieved with both old and new valves. The **Irrigander 8/2 Pro** expander Decoders are built to rugged industrial standards and are sealed to provide long life and high reliability in any environment.

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

Irrigander[®] 8/2 Pro Expander

8 Zone Irrigation Expander

Overview

The **Irrigander 8/2 Pro** expander is comprised of two types of modules: an Encoder that is installed close to or inside the irrigation controller; four Decoders 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. Each Encoder is attached to the Decoder using 2 wires: a field control wire; and the system common wire. These wires are typically the existing field control wires in the irrigation system to be expanded. Each Decoder has 2 output wires that are attached to the two valves to be controlled. Each Encoder can drive up to 4 Decoders (eight total valves).

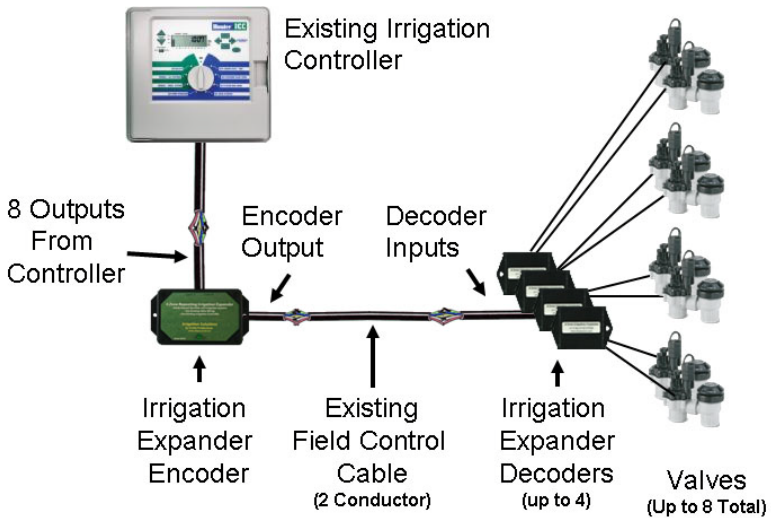


Figure 1 – Typical Installation

Irrigander[®] 8/2 Pro Expander

8 Zone Irrigation Expander

Installation Instructions

Installation Options

The **Irrigander 8/2 Pro** expander can be installed in a variety of different ways depending on the layout of the system and the desired expansion. The Decoders can be installed on a single field wire at multiple locations by “Daisy Chaining” the field wire from one Decoder location to the next. In this installation method the start of the field wire at the irrigation controller will be connected to the output on the Encoder and each Decoder will be connected to the next Decoder in the field (see Figure 2).

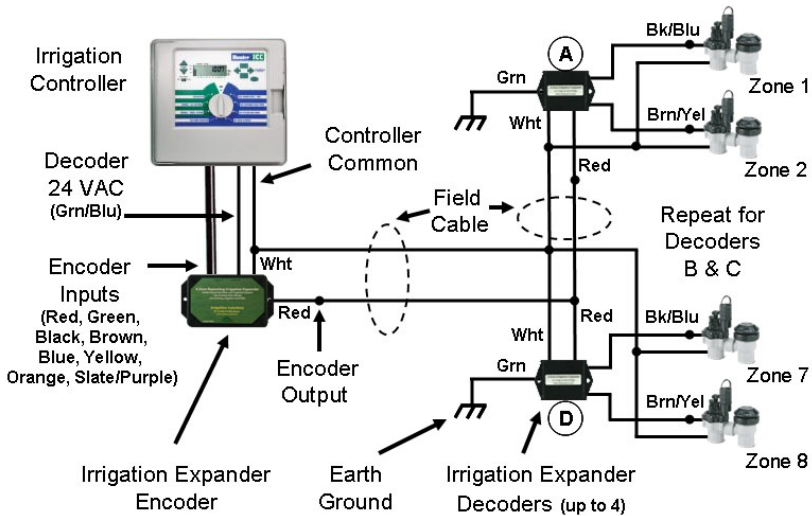


Figure 2 – “Daisy Chain” Schematic Diagram

Separate field wires can also be used to connect each Decoder location to the Encoder in a “Home Run” configuration. In this installation method all of the field wires running to the Decoder

Irrigander[®] 8/2 Pro Expander 8 Zone Irrigation Expander

locations will be connected together and to the output of the Encoder (see Figure 3).

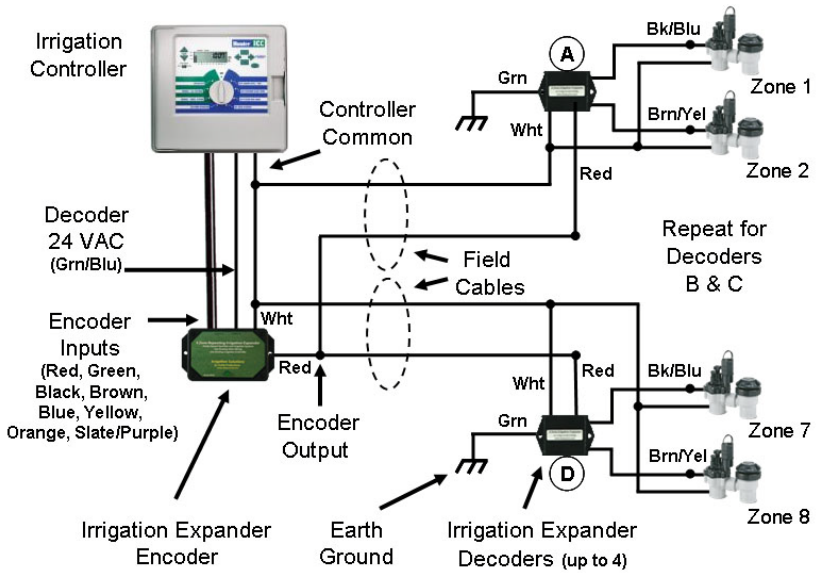


Figure 3 – “Home Run” Schematic Diagram

Any combination of “Daisy Chain” and “Home Run” will also work. Note that each field wire should terminate in a connection to a Decoder in order to maximize the protection from electrical surges.

Irrigander[®] 8/2 Pro Expander

8 Zone Irrigation Expander

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

Irrigander[®] 8/2 Pro Expander

8 Zone Irrigation Expander

4. Disconnect a field control wire (or wires for “Home Run” installation) from the irrigation controller that run to the location(s) where the new valves will be installed and connect the wire(s) to the Encoder output (“Cable B” Red) using a twist-on wire connector. Remember the color code on the field wire(s); the field wire(s) will be connected to the Decoders at the location of the valves to be expanded when installing the Decoders (see “*Installing the Decoders*”).
5. Connect the Common on the Encoder (“Cable B” White) to a common point 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.

Irrigander[®] 8/2 Pro Expander

8 Zone Irrigation Expander

Installing the Decoders

1. Each Decoder can drive 2 valves and has a letter designating which zones are assigned to that Decoder:

Decoder	Zones
A	1, 2
B	3, 4
C	5, 6
D	7, 8

Table 4 - Decoder Zone Assignments

Select a Decoder that corresponds to the desired zones to be controlled.

2. 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.
3. The wires on the Decoder are listed in Table 3. The color coding on the Decoder wires may vary depending on the particular cable used in the manufacture of the Decoder:

Wire Color	Use
Red	Decoder Input
Green	Earth Ground
White	Common
Black or Blue	Zone 1 output
Brown or Yellow	Zone 2 Output

Table 3 - Decoder Cable Color Coding

Irrigander[®] 8/2 Pro Expander 8 Zone Irrigation Expander

4. Connect the Common on the Decoder (Decoder 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[®] Waterproof Connector).
5. Connect the Decoder input (Decoder Red) to the field wire used in Step 4 of “*Installing the Encoder*” using a waterproof wire connector.
6. Connect each of the two Decoder outputs (see Table 3) to the second solenoid wire from each of the valves to be controlled using a waterproof wire connector.
7. Connect the Earth Ground (Decoder Green) 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.
8. Install each of the remaining Decoders repeating steps 1 through 7. Be sure to use the same field wire(s) used in Step 4 of “*Installing the Encoder*” when installing the Decoders. **Note: when installing more than one Irrigander 8/2 Pro in a system that the output of each Encoder can drive a maximum of four Decoders and each Decoder must have a unique letter designator.**

Installation is complete! Test all zones by cycling the outputs from the irrigation controller connected to the **Irrigander 8/2 Pro** expander.

Irrigander[®] 8/2 Pro Expander

8 Zone Irrigation Expander

Surge Protection

Just like any other field installed electronic device, surge protection is vital to the reliable operation of the **Irrigander 8/2 Pro** expander. The Decoder and the Encoders 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 8/2 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 (Decoder Green) 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 (Decoder Green) from the Decoder to the ground rod using a copper clamp. Do not put more than one wire under the clamp.

Irrigander[®] 8/2 Pro Expander

8 Zone Irrigation Expander

Operating the Irrigander 8/2 Pro Expander

The information below describes the various operating modes of the **Irrigander 8/2 Pro** expander.

Idle

While the **Irrigander 8/2 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 8/2 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 8/2 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 8/2 Pro** expander's Encoder communicates with each 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.

Irrigander[®] 8/2 Pro Expander 8 Zone Irrigation Expander

Replacing the Encoder Fuse

The **Irrigander 8/2 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.

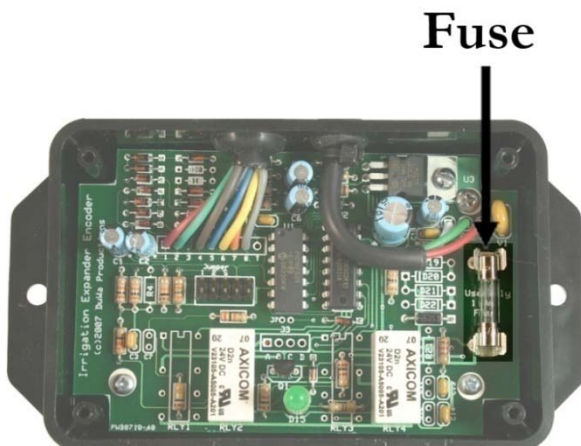


Figure 2 – Fuse Location

Irrigander[®] 8/2 Pro Expander

8 Zone Irrigation Expander

Troubleshooting

Problem	Cause	Solution
The Irrigation Controller will not turn on any valves connected to the Irrigander 8/2 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 the inputs 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

Irrigander[®] 8/2 Pro Expander

8 Zone Irrigation Expander

Specifications

Expansion Capability

Each **Irrigander 8/2 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 ¹	2	3	4
# Valves w/out Expander	1	2	3
# Valves w/Irrigander 8/2 Pro	8	16 ²	24 ³

Table 4 – Expansion Capability

Notes:

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

Physical Dimensions

	Width	Height	Depth
Encoder	5.1"	2.9"	1.1"
Decoders	3.0"	2.1"	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: 1.2 watt max

Valves per Zone

Each output from the **Irrigander 8/2 Pro** expander's Decoders 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.

Irrigander[®] 8/2 Pro Expander

8 Zone Irrigation Expander

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 8/2 Pro** expander Decoders can be located up to a total of 1500 feet from the Encoder using 18 gauge field wiring or 2500 feet using 14 gauge field wiring. The valves to be controlled can be up to 100 feet from each Decoder using 18 gauge wiring.

Simultaneous Active Zones

The **Irrigander 8/2 Pro** expander can only have one output active at a time. If more than one input is active, the **Irrigander 8/2 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 under water.

Irrigander[®] 8/2 Pro Expander

8 Zone Irrigation Expander

Limited Warranty

DUWA PRODUCTS LLC, hereinafter referred to as the manufacturer, warrants the **Irrigander 8/2 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 8/2 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 8/2 Pro Expander** is installed with a suitable earth ground as described herein. The use of the **Irrigander 8/2 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.

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