



User Manual

V2.2.1

Copyright 2024 – Reef Angel

All Rights Reserved

The product and the information contained herein are subject to change without notice.
This manual may not, in whole or in part, be reproduced or transmitted in any form either electronically or mechanically, including photocopying and recording, without the express written consent of Reef Angel.

Important Safety Instructions



PLEASE READ AND FOLLOW ALL SAFETY INSTRUCTIONS BEFORE PROCEEDING

DANGER

Discontinue use if any signs of water are present in any electronic/electrical device.

WARNING – To avoid injury to yourself and others, safety precautions should always be observed.

DANGER – Never attempt to service any electronic /electrical equipment before unplugging the device from the outlet. Risk of electrical shock if care is not taken. Special care should always be taken when operating any aquarium equipment. If the plug or receptacle gets wet, NEVER unplug it from the outlet. Always use the fuse or circuit breaker that supplies power to the device. Disconnect it and then examine for water presence.

- If the device shows any sign of abnormal appearance, discontinue use.
- Never operate the device if plugs or cords are damaged, torn, ripped or malfunctioning.
- A “drip loop” should be arranged and position your aquarium stand and tank to the side of the power receptacle to avoid the device or power receptacle from getting wet. Please refer to Figure 1 below.

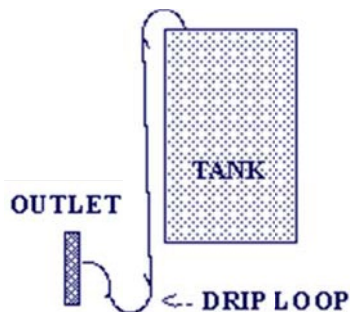


Figure 1

Contents

Welcome to Reef Angel	4
Package Contents	5
Features	5
Controller Head Unit.....	6
Output Port.....	7
Input Port.....	7
Getting Started	8
Getting Familiar with your Controller	9
Parameters Screen	9
Custom Expansions Screen	9
Relay Screen	10
Input/Output Screen	10
DC Pump Control	11
Expansions.....	12
Alerts	12
Status Screen	13
Menu Options	13
Universal Relay Box.....	13
Connecting to Uapp	13
Need Help?	13

Welcome to Reef Angel

Thank you for choosing the Reef Angel Controller kit for your reefing needs. Reef Angel is the first controller kit to offer reefing hobbyists' full control of both hardware and software to accommodate all their reefing requirements.

With the Reef Angel Controller, you have the power to create the most sophisticated control system you will ever need. Its user-friendly interface and easy-to-learn programming language provide endless possibilities. Built on the same open-source electronics prototyping platform as the world-famous Arduino, Reef Angel ensures your controller operates on the most stable platform available. Programmers worldwide have dedicated countless hours to perfecting the code on this platform.

Not familiar with programming? Looking for an all-in-one, out-of-the-box solution for your reef system? No problem. Our online [Webwizard](#) makes setting up your Reef Angel Controller incredibly simple.

Reef Angel Star Controller

Package Contents

1. Head Unit
2. Universal Relay Box Expansion
3. SD Card
4. 3x Temperature probes
5. pH probe
6. pH 7.0 and pH 10.0 calibration fluids
7. 2x float switches
8. Power adapter
9. USB cable

Features

1. 2.8" capacitive touch screen
2. SD Card for storage of data and images
3. 3x temperature probe ports
4. pH port
5. 3x input ports
6. 4x output ports (configurable to 0-5V PWM, 0-5V analog, 0-10V PWM or 0-10V analog)
7. Rope leak detector port (rope leak sensor not included)
8. 2x Expansion ports
9. Ethernet port
10. 8x controllable outlet ports
11. Cloud server compatible (Control and monitor without any port forwarding setup)
12. Remote firmware update

Controller Head Unit



1. 2.8" Capacitive Touch Screen
2. Power/Programming Port
3. SD Card
4. Status LED
5. Temperature Probe Ports
6. pH Probe Port
7. Input Ports
8. Output Ports
9. Rope Leak Detector Port



- 10. Expansion Ports
- 11. Ethernet Port

Output Port

Make sure to pay attention to the polarity.

Pin	Label	1 2 3 4 5 6 7 8
1	Daylight 1 +	
2	Daylight 1 -	
3	Daylight 2 +	
4	Daylight 2 -	
5	Actinic 1 +	
6	Actinic 1 -	
7	Actinic 2 +	
8	Actinic 2 -	

Input Port

There is no polarity on the input ports when used with the float switches.



High ATO Low ATO Alarm

Getting Started

Using your Reef Angel Controller for the first time

1. Plug one side of the USB cable on the programming port on the side of your Reef Angel controller.
2. Plug the other end into your computer.
3. Open your browser and go to <https://forum.reefangel.com/webwizard> (Chrome and Edge Supported)
4. Click the menu button on the top left corner.
5. Click “Download Plugin” (figure 1)
6. The plugin will be downloaded. Install it when the download is completed.
7. You should see a blue box with “Plugin found and connected” if the plug in is installed correctly.
8. Click Wizard
9. Choose Reef Angel Star controller.
10. Follow the prompt and set it up according to your own environment.
11. At the end, the web wizard will generate the code that you can upload to your controller.
12. Make sure to select the correct local serial port. Remote upload is not available for the first-time setup.
13. When the upload is completed, the unit will reboot, and your code will be running.
14. Disconnect the USB cable from the computer and connect it to the power adapter.

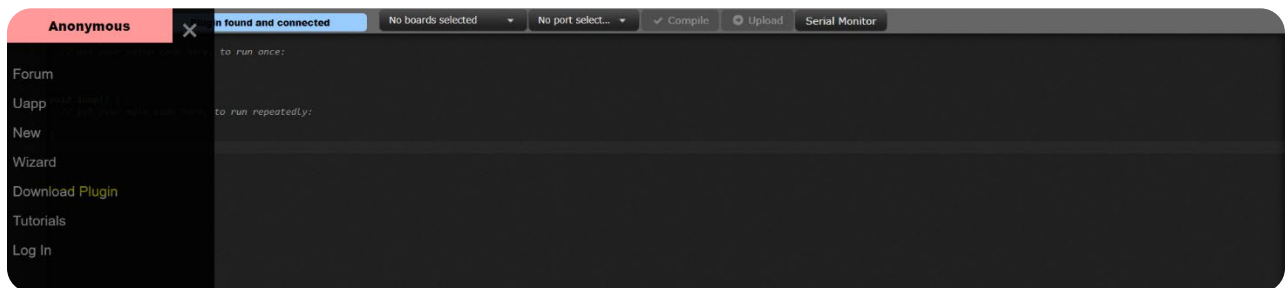


Figure 1

Getting Familiar with your Controller

The Reef Angel Star is equipped with a 2.8-inch capacitive touch screen, a unique and rare feature in the controller market. This touch screen allows you to change settings, view parameters, and toggle relay ports without the need for a smartphone or computer.

Screens and Functions

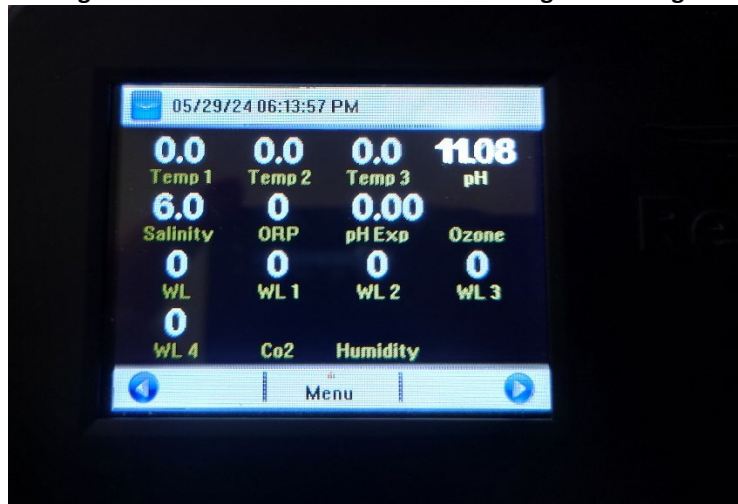
Below you will find detailed descriptions of each screen and its functions:



Parameters Screen

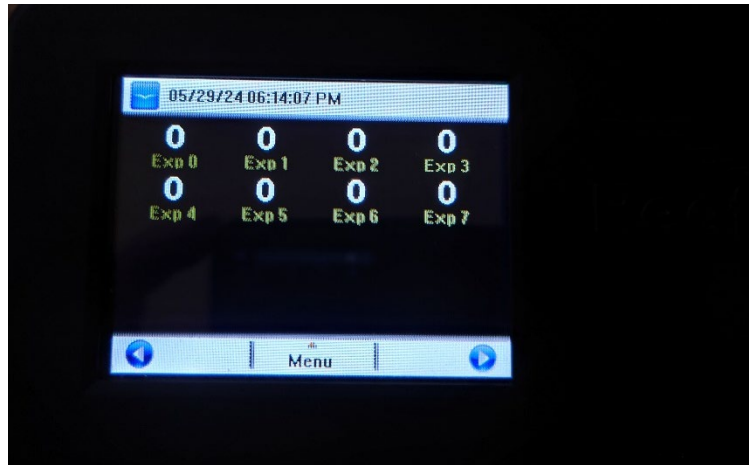
On the Parameters Screen, you can monitor your temperature probes and pH readings. If you have additional expansions, such as ORP, pH Expansion, Ozone, Water Levels, CO2, Salinity, and Humidity sensors, their readings will also be displayed here. This centralized display ensures you have all critical data at your fingertips.

Clicking on the bottom blue arrow either left or right will navigate to the next screen.



Custom Expansions Screen

The Custom Expansions Screen works in conjunction with the Reef Angel Cloud Hub. This feature is particularly useful for users with multiple expansions, such as Salinity, ORP, Ozone, and Water Level sensors. Since the controller only supports one of each type of expansion, the Cloud Hub allows you to connect additional expansions and display their values on the Reef Angel Star Custom Expansion Screen.



Relay Screen

The Relay Screen allows you to view the status of each port on the Relay Expansion. A green box next to a port label indicates that the port is on, while a red box signifies that the port is off.

You can toggle each port by clicking on the box next to the label, changing the port's status from red to green or vice versa. When you manually change the state of a port, a yellow "override" text will appear under the label, indicating that the port is no longer being controlled by the parameters set during the initial setup.

To cancel the override and return the port to its normal state, touch the port label with the override text beneath it.

The system supports up to 8 relay expansions, providing control for up to 64 relay ports. Using the Webwizard, you can customize the name of each port label displayed on the screen.

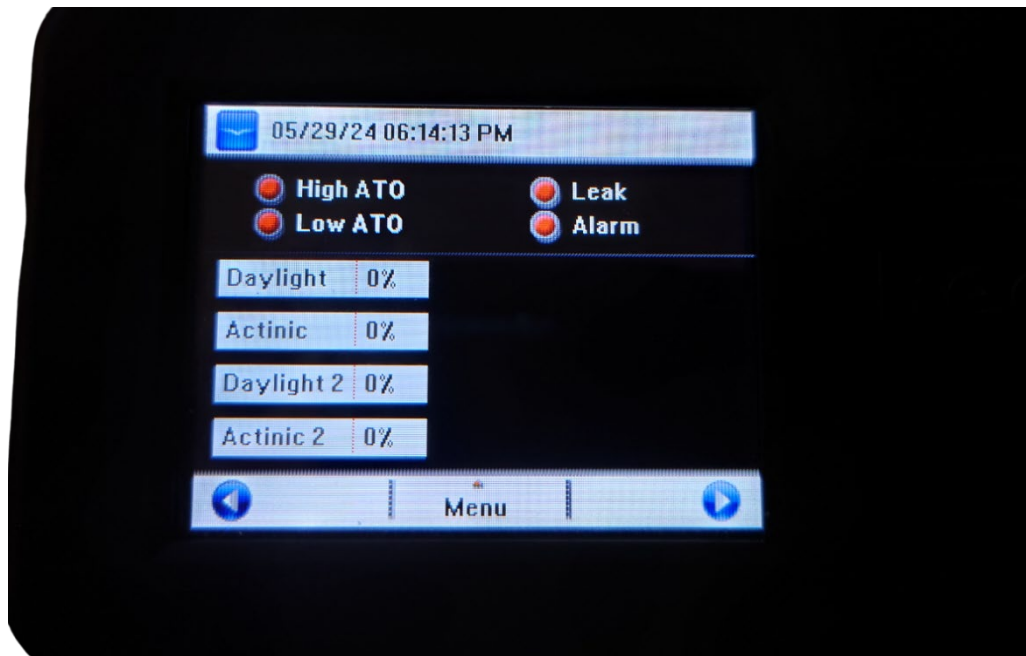


Input/Output Screen

The Input/Output Screen displays the status of both the output/dimming ports and the input ports.

At the top, you will see four input indicators: High ATO, Low ATO, ALARM, and Leak. The first three are for float switches, buttons, or any two-wire signal inputs. The Leak port is designed for the rope leak detector; when this port is activated (i.e., when the circuit is completed), the bubble will change from red to green.

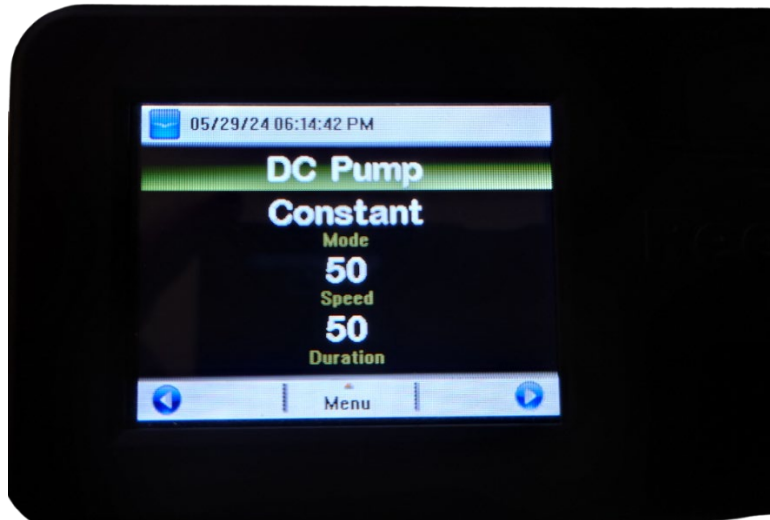
Below the input indicators, you will find four sliders accompanied by percentage values. These sliders control the four output ports on the Reef Angel Star controller. You can adjust the output values by clicking on each slider. These ports are commonly used for controlling lights, DC pumps, dosing pumps, fans, and many other devices. Each port is configurable for 0-10V PWM and analog, as well as 0-5V PWM and analog.



DC Pump Control

The Reef Angel Star can control DC wave pumps through 0-10V control. Once configured, a new screen for the DC Pump will appear. This screen displays the current speed, duration, and mode of the pump.

While you cannot change the mode directly from the Star screen, you can switch to Water Change Mode and Feeding Mode by clicking on the menu button. To change the DC pump mode, you will need to use the [Reef Angel Uapp](#).



Expansions

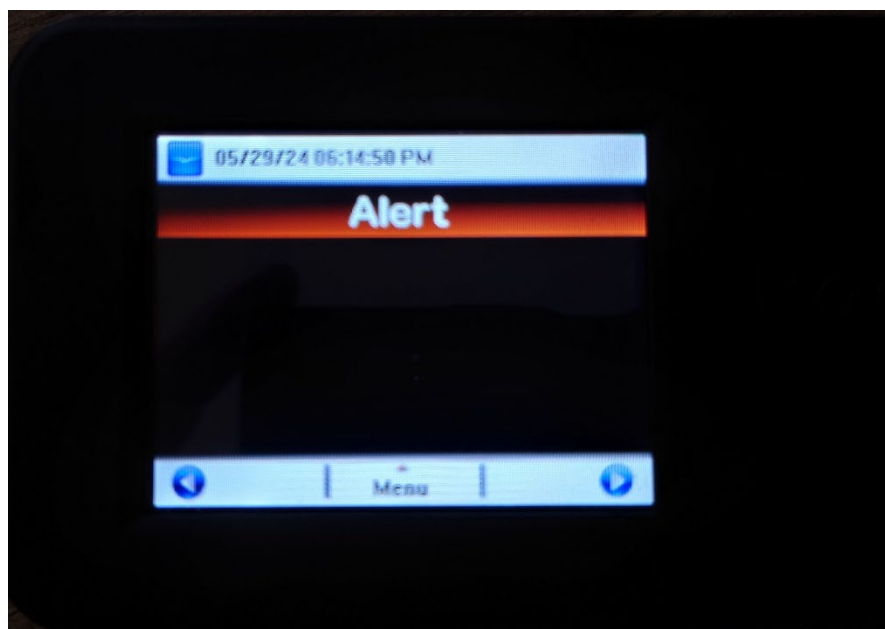
The Reef Angel Star supports all official expansions released by Reef Angel. When adding a new expansion, some will be displayed on the Parameters screen, while others will have their own dedicated screen.

Expansions such as Dimming, IO, and RF will each have their own dedicated screen to show their status. Meanwhile, expansions like salinity, ozone, and CO2 will be displayed on the Parameters screen.

Alerts

The Alerts Screen displays any current alerts on your device. Possible alerts include ATO Timeout, Overheat, Bus Lock, and Lights On.

If no alerts are active, the screen will remain blank.



Status Screen

The status screen provides details on the if the device is connected to the cloud server as well as the IP address of the device.

Menu Options

When you click on the menu button, you will see several additional options. This is where you can set the time and date, activate different modes, and calibrate probes and expansions.

Universal Relay Box

The Universal Relay Box allows for 8 Controllable relay Ports. Each port has a maximum rating of 5 Amps. The entire relay box can handle a maximum of 10 Amp Load.

The Reef Angel Star can control up to 8 relay boxes, to this you will need the Expansion Hub which allows for more expansion ports. Please refer to the Relay Box Manual for more information.

Connecting to Uapp

To monitor and control your Reef Angel Star remotely and set up email/push alerts to your devices, follow these steps:

1. Visit forum.reefangel.com/uapp.
2. Click the settings icon in the bottom right-hand corner.
3. Select "Add Controller."
4. You will see a login form where you will enter the username and password of your forum account used when setting up your Reef Angel Star.

Once added, you can enjoy the peace of mind that comes with controlling and monitoring your reef aquarium from anywhere in the world.

Need Help?

If you need help with your controller or have questions, please browse our forum for numerous tips and helpful information.

If you cannot find what you're looking for in the forum, please reach out to us at info@reefangel.com, and one of our team members will be happy to assist you.