MANUAL

LAC-12 /LAC-30

1 Table of contents

2 General

The LAC-12 is the next gen Collison avoidance system. Designed specifically for overhead cranes it has reflector less technology. Then paired with 2 120/240VAC relays, prewired pigtail it is and easy installation. With Wi-Fi built in the setting of set points is now done over Wi-Fi to get the technicians off the crane when setting the distances and making fine adjustments.

3 Overview

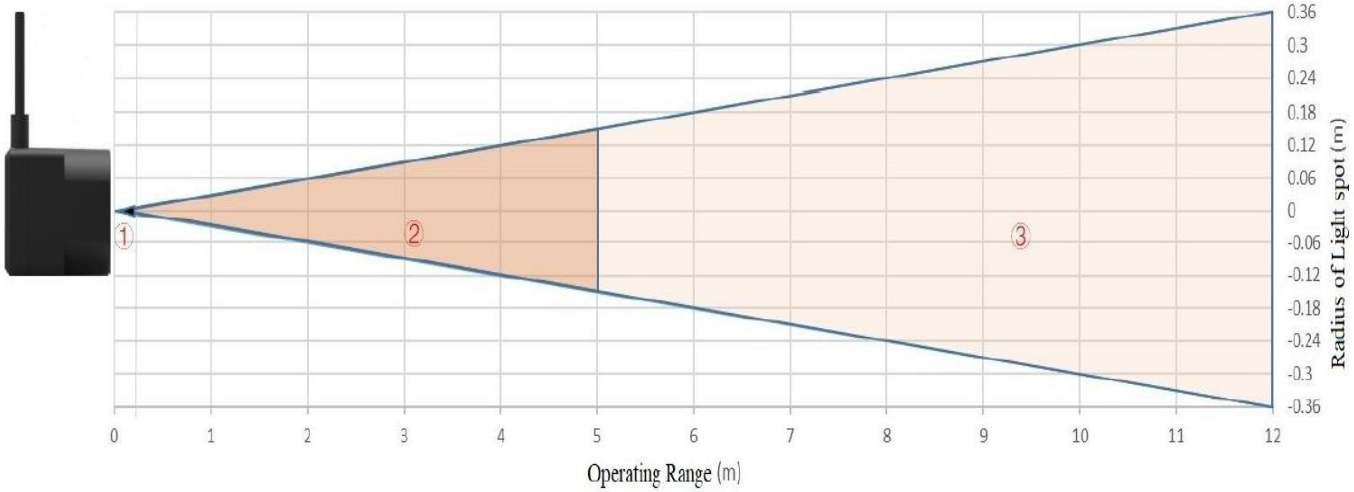
The LAC-12 is a collision avoidance product using 850nm (near infrared) wavelength LEDs and a eye with a 1mm photodetector and 3 deg beam angle for some misalignment.

Basic:

1. Processor
2. 1 120V input
3. 2 NO/NC relay outputs
4. 90-240VAC Power supply
5. Sensor

The LAC-12 has a 12 Meter (36ft) Range with 2 relay setpoints
The relay setpoints are adjustable via the LAC-12 Webapp and real time distance is available in the webapp as well as the relay status of each relay.

4 Description



① Represents the detection blind zone, 0-10cm, within which the output data is unreliable.

② Represents the operating range detecting black target with 10% reflectivity, 0.1-4m.

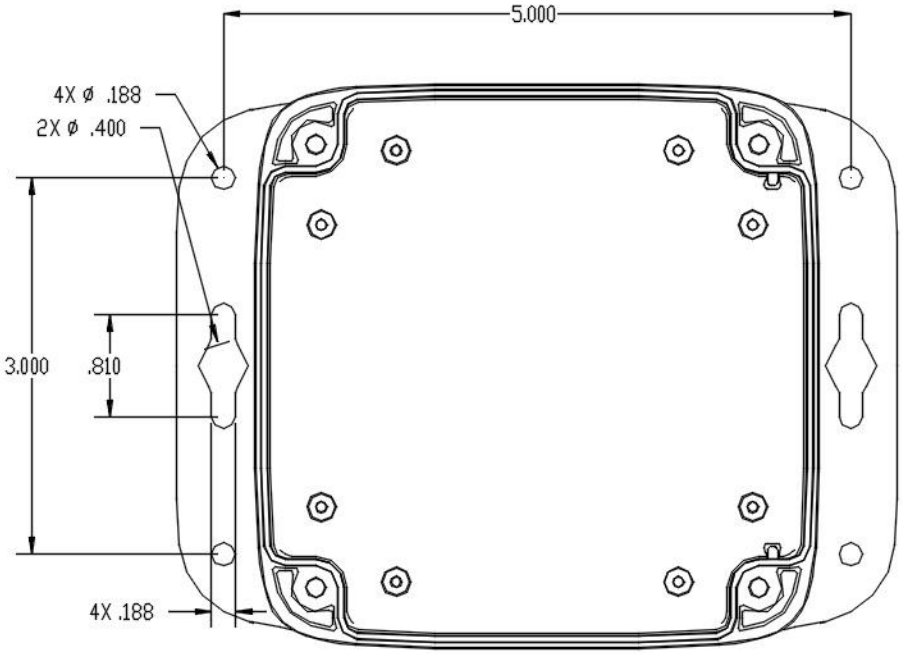
③ Represents the operating range detecting white target with 90% reflectivity, 0.1-12m.

5 Installation

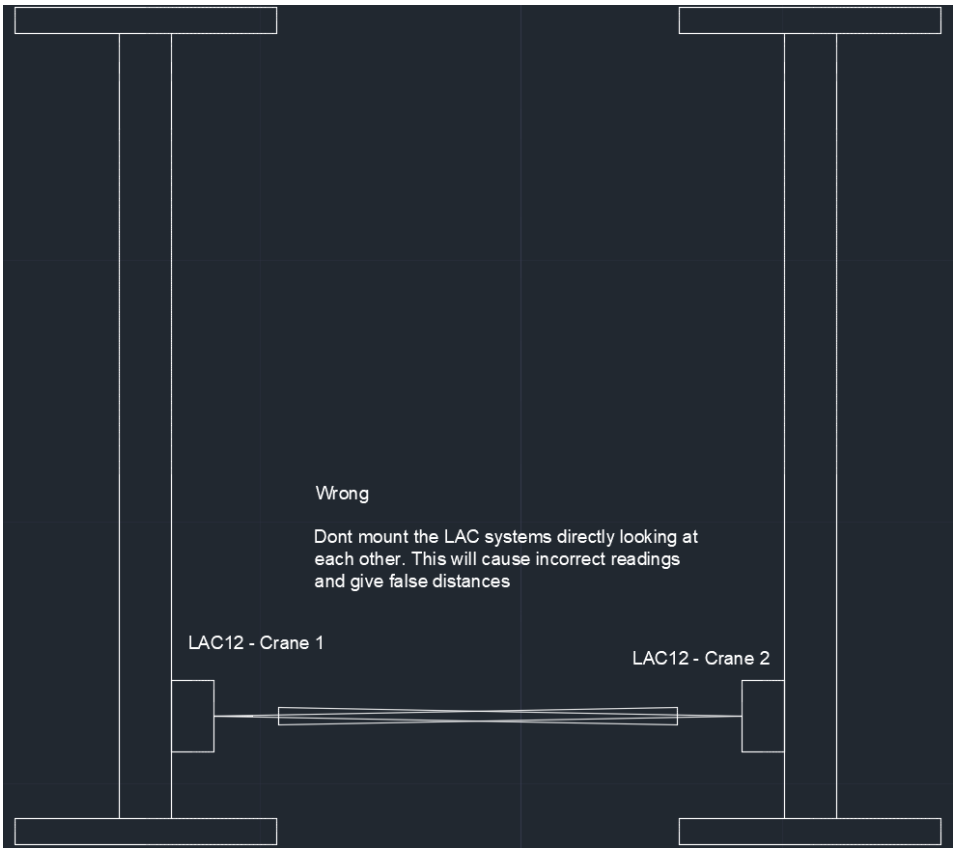
Follow the instructions as described in this manual for the installation of this product.

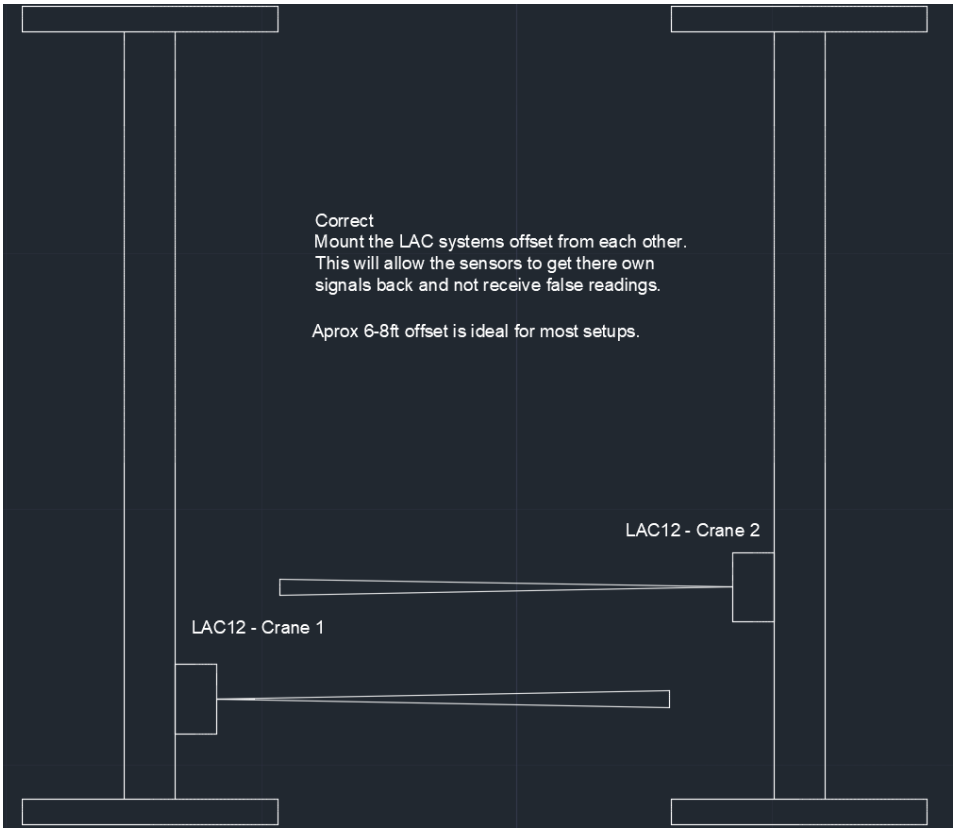
5.1 Dimensions

The following diagram shows the mounting dimensions for the **LAC-12**



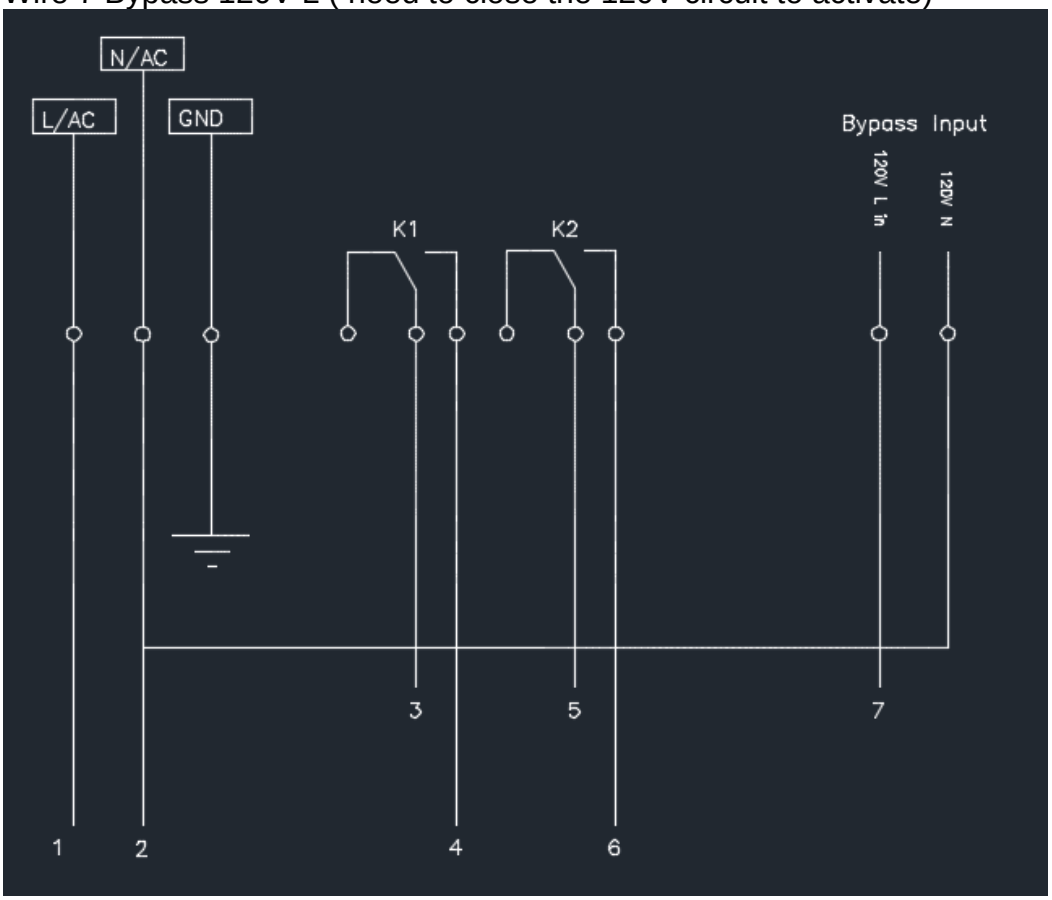
OFFSET :


Wrong
Dont mount the LAC systems directly looking at each other. This will cause incorrect readings and give false distances
LAC12 - Crane 1
LAC12 - Crane 2


Correct
Mount the LAC systems offset from each other. This will allow the sensors to get there own signals back and not receive false readings.
Aprox 6-8ft offset is ideal for most setups.
LAC12 - Crane 2
LAC12 - Crane 1

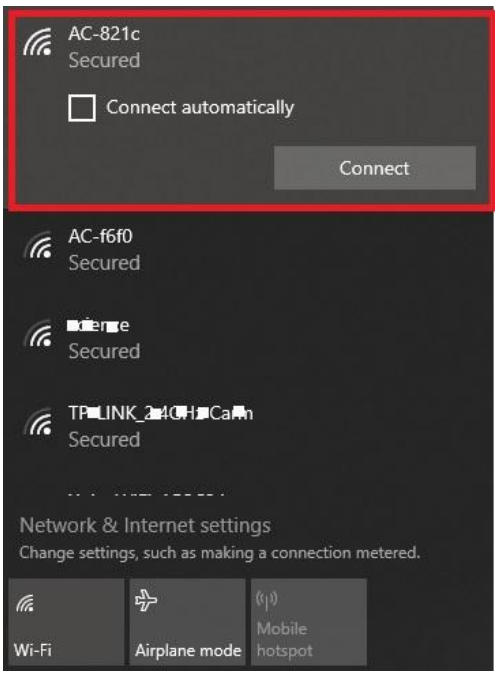
5.2 Instructions

- Turn off the power supply.
- Locate a suitable place to install the **LAC-12**, with clear line of site to the opposite crane you are trying to stop the collision. Align the LAC-12 so the sensor is facing a clear free surface to reflect the light back without obstructions. (like the girder of the 2nd crane.)
- Connect the input power wires LAC-12 pigtail**.**
- **Wire 1 L**
- **Wire 2 N**
- Connect the relay output cables to the corresponding connections on crane function you want to slow and stop.
- Wire 3 Motion voltage Common (Stop)
- Wire 4 Motion voltage output (Stop)
- Wire 5 Motion voltage Common (Slow)
- Wire 6 Motion voltage output (Slow)
- Wire 7 Bypass 120V L (need to close the 120V circuit to activate)



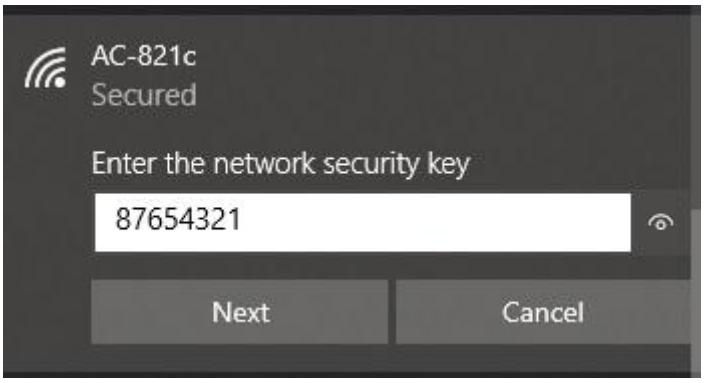
5.3 Wifi log in

Open your phone/tablet/PC and look for accessible wifi hotspots



Select AC - **** where the **** is the last 4 digits of the units mac address.

the Password is 87654321

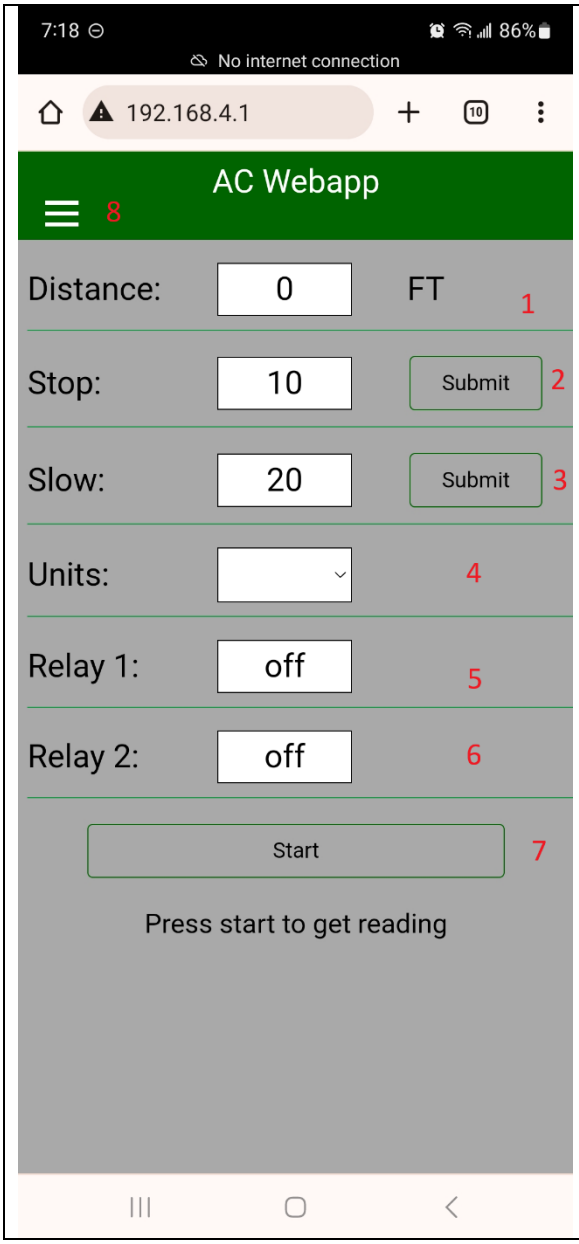


6 Webapp

Once you are connected to the LAC hotspot you can then proceed to open your browser on your device. Chrome, Opera, Firefox …..

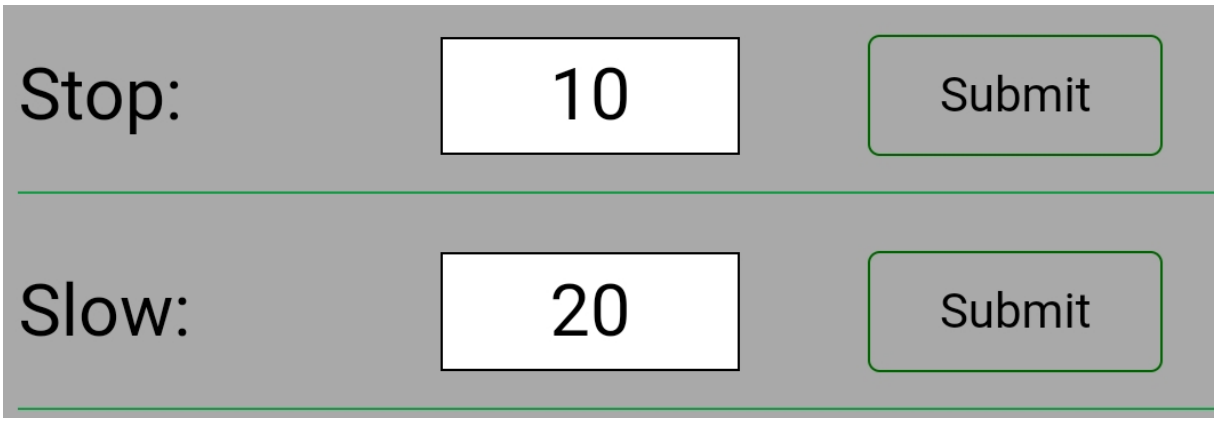
Then type in the IP of the unit which is 192.168.4.1

If you are connected properly the webapp should like and you should see the following.

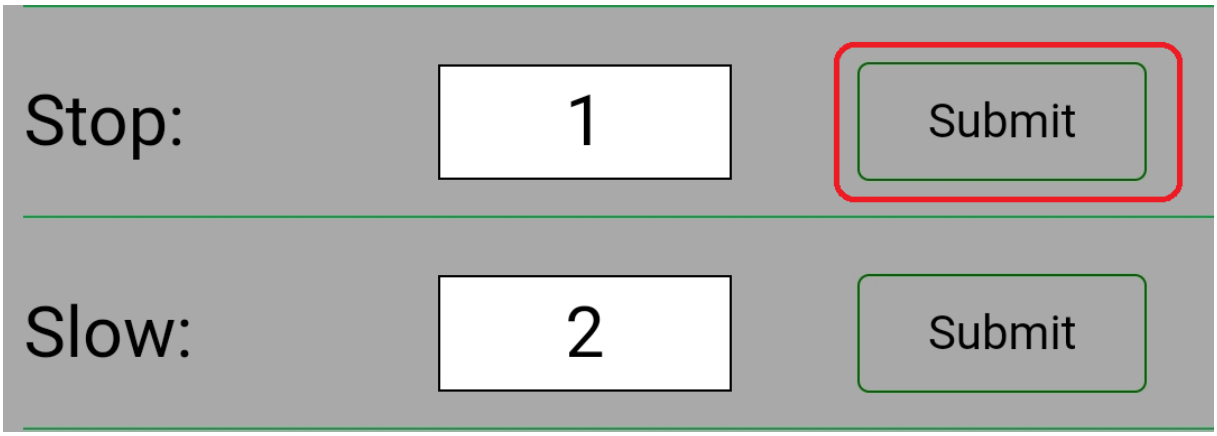


1. Distance reading once you press start
2. Stop setting , changeable
3. Slow setting, changeable
4. Units selection, mm or FT
5. Relay 1 status ON or OFF
6. Relay 2 status ON or OFF
7. Start button to get the reading
8. Navigation menu to go to other pages

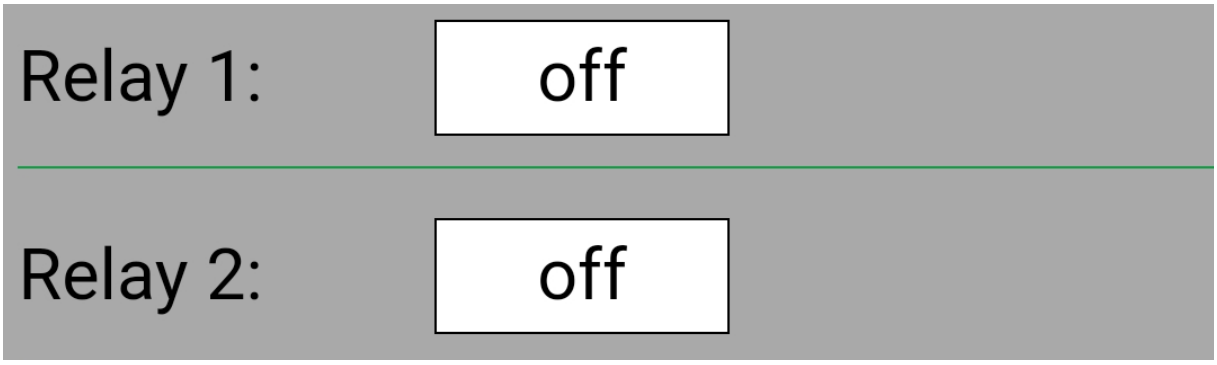
Row 2 & 3 are the slow and stop setpoints. They will populate on the page load of the current settings.



To change the setting put your cursor in the box you want to change and delete the old settings. Then put in your new setting and press the submit button beside the slow / stop that you are changing.



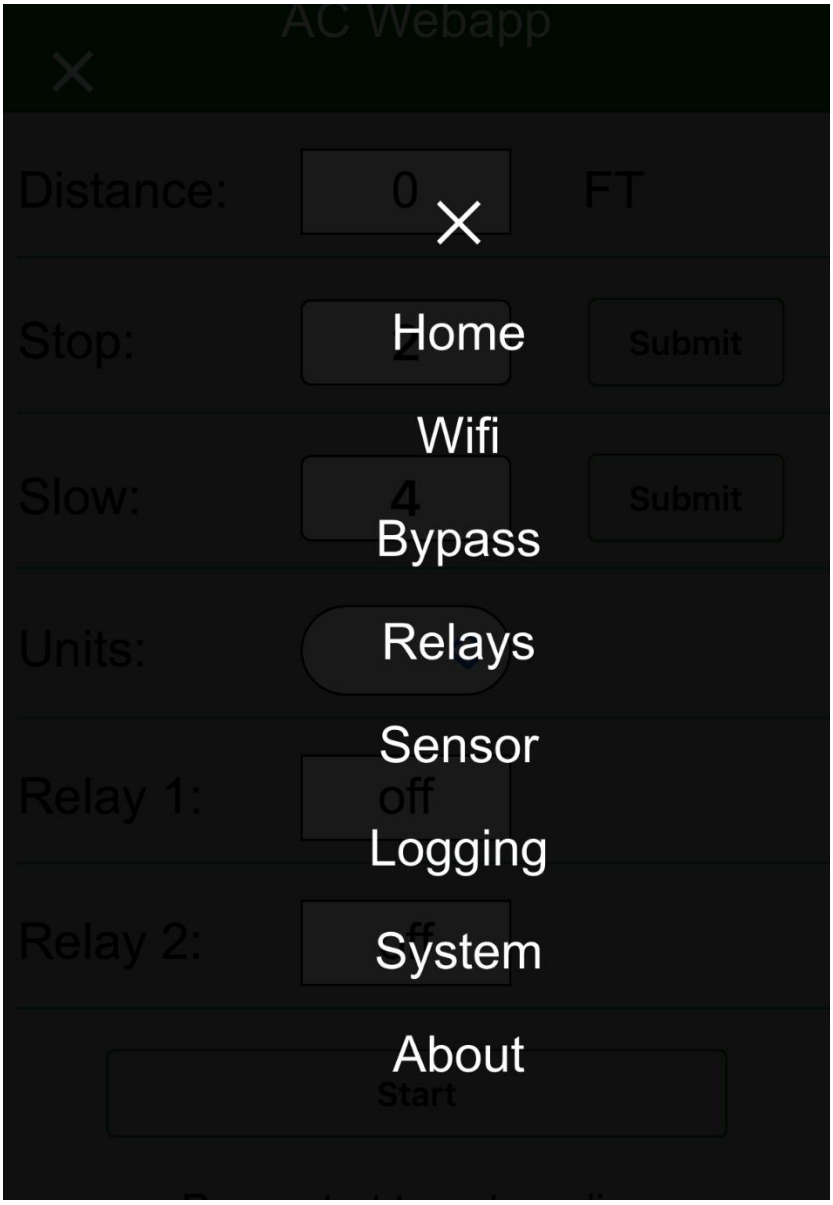
The relay status will also show if the relays are on or off. Items 5 & 6



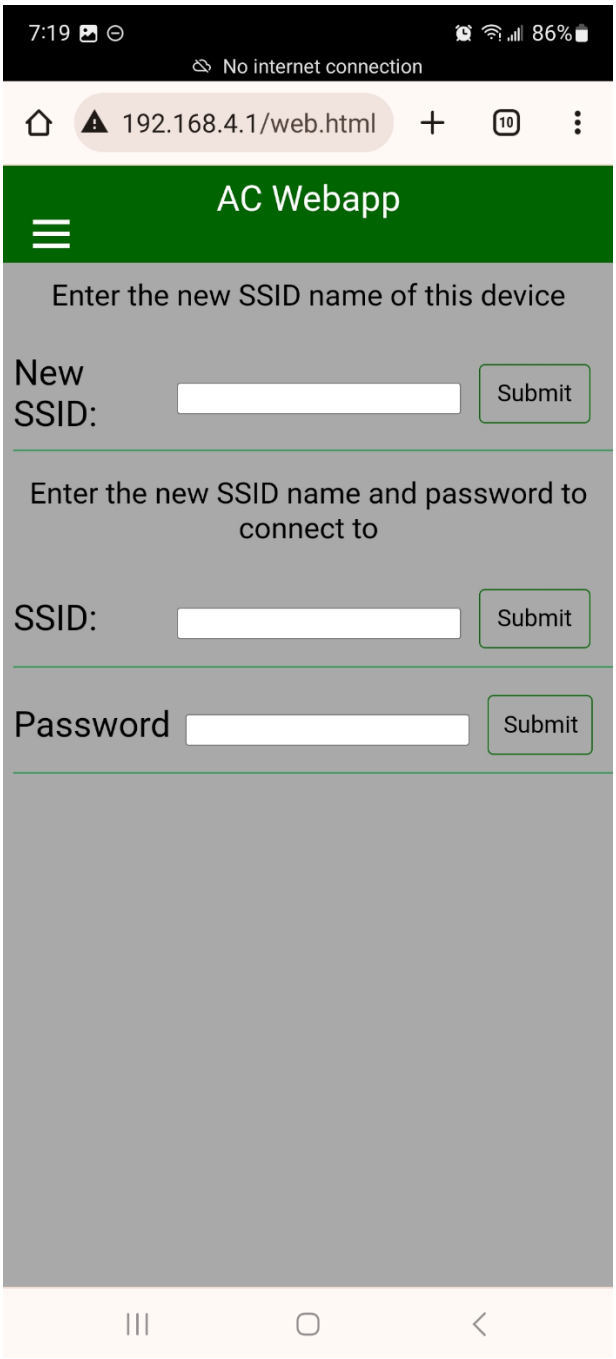
To go to start the readings of the distance sensor press start.

To move to other page settings click the navagation menu 8.

Once you press the navigation menu it will open like this.

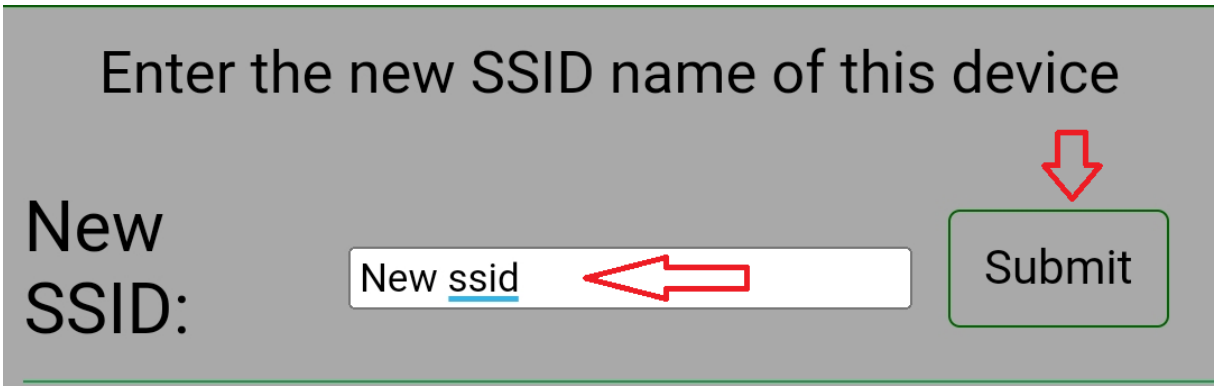


If you click the Wifi tab it will bring you to the wifi settings page.

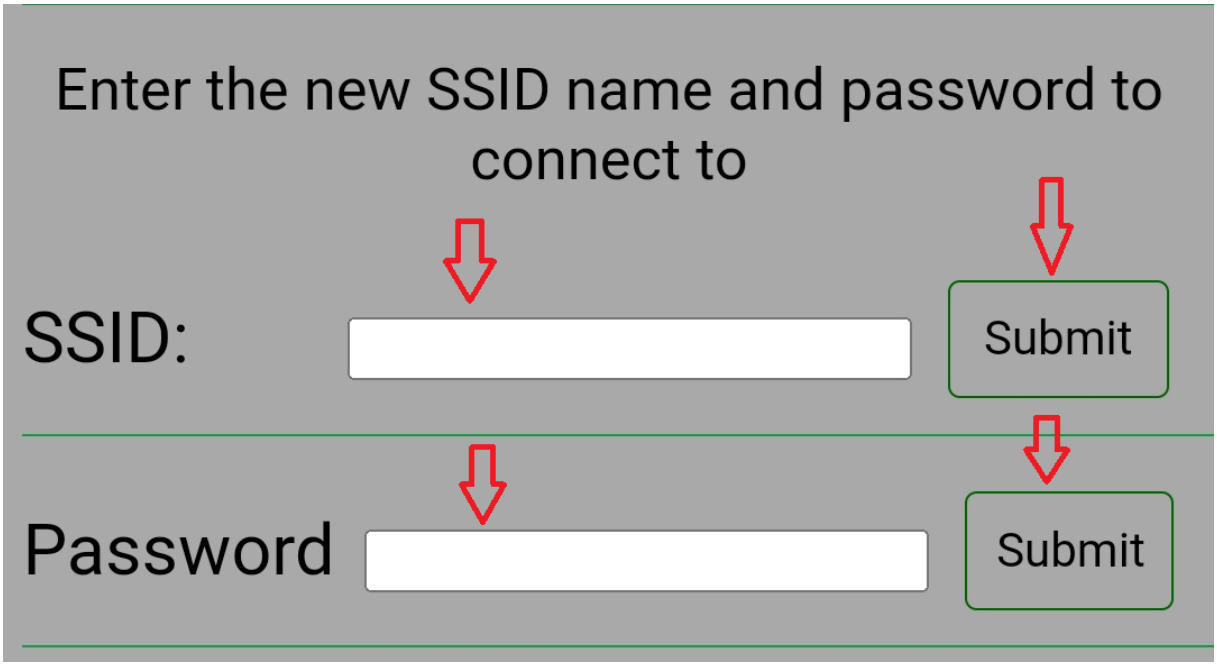


The Default SSID of the unit is AC-**** where the 4 * are the last 4 digits of the mac address. If you have multiple units in the same facility it can be hard to keep track of the SSID you are logging into.

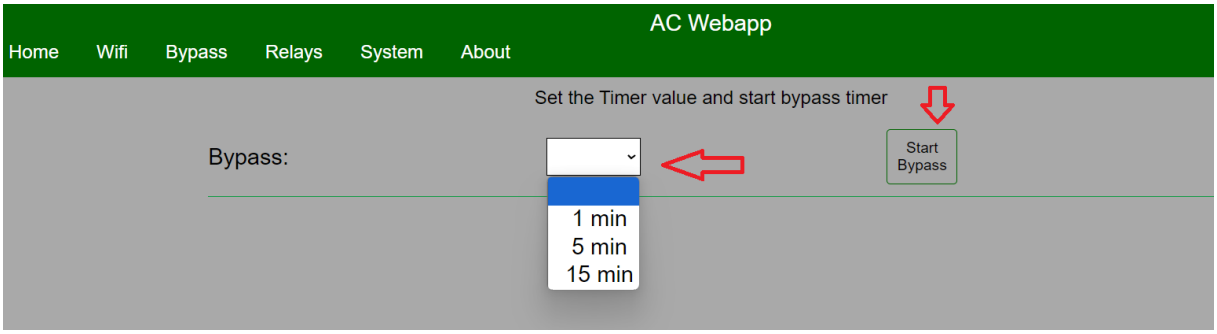
Here you can change the name of this LAC wifi access point. To Something more recongizable onsite Like the Crane number. To do this click in the new name area change to the new name you want and press submit.



The LAC and can also connect to a wifi network. To do so enter the SSID and PASSWORD of the network you want to join.



You can choose to bypass the system by clicking the bypass button



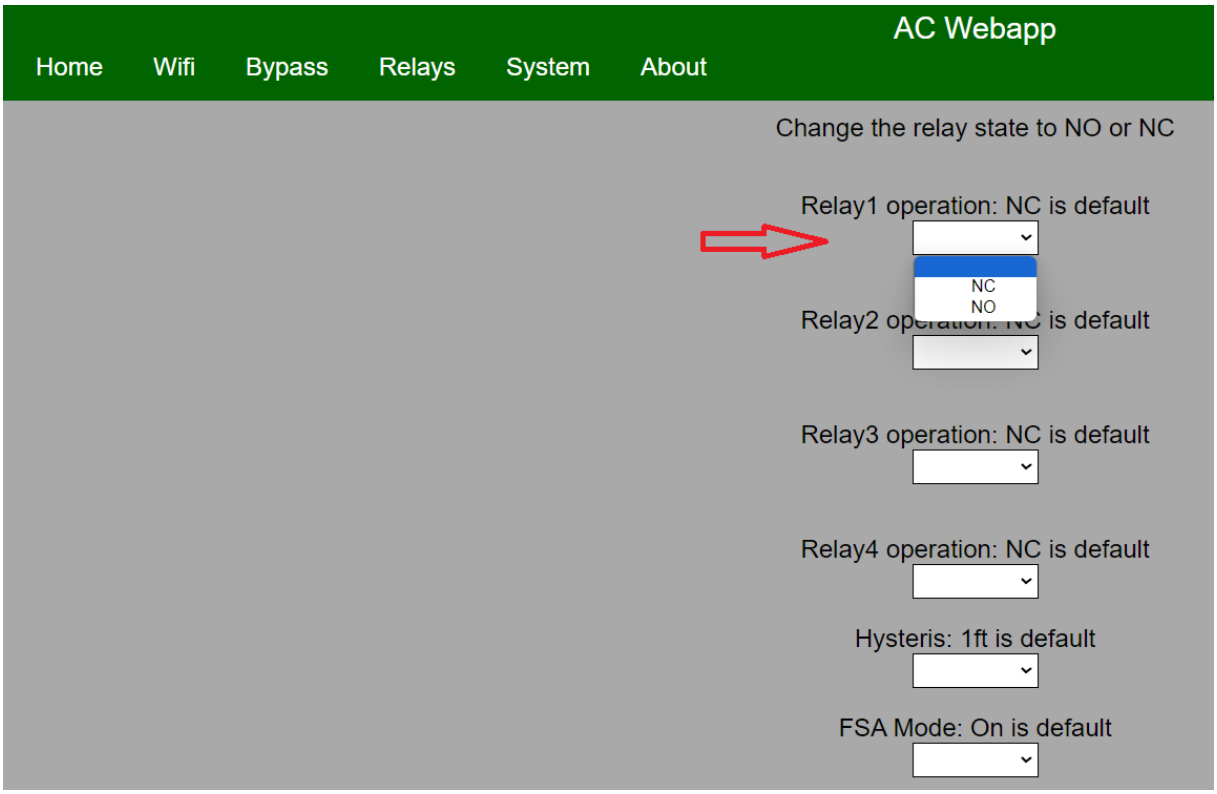
The Bypass button is not permeant due to safety reasons. You can choose 4 settings for bypass to help move the crane if it is stuck or if you haven't finished installing the system yet and need to move the crane.

Pressing Start Byass without choosing a time will default to 30 sec
Other options are
1 min
5 min
15 min.

Once you press start bypass the relays will stay closed until the timer is up.
The LED on the unit should be White while its in bypass mode.

The System is setup with the relays turning on using normally open contacts.
So these contacts will close during normal operation.

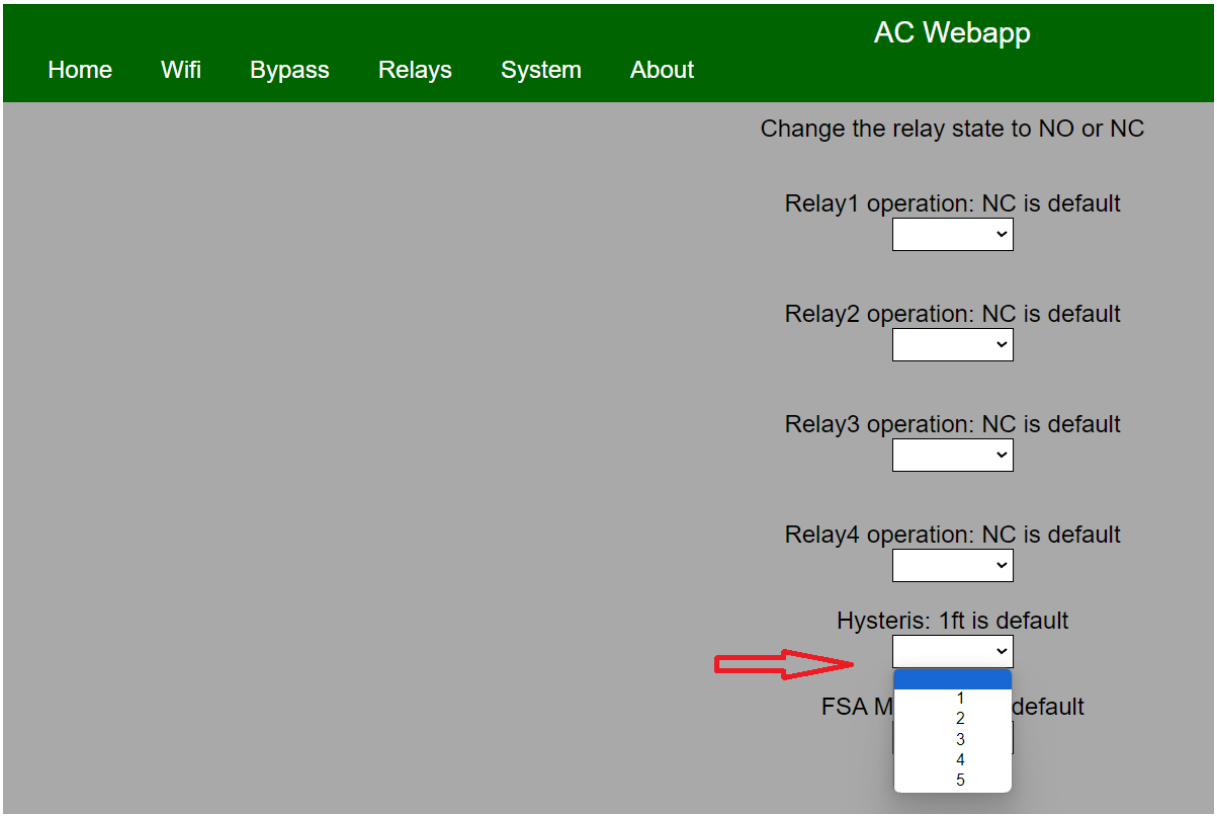
Sometimes the crane cant except this wiring and it either needs to be rewired to the NC contacts or we have a way to switch the relay operation in the software without rewiring the outputs.



To Change the operation of the relay Pick the relay you want to swap the contact via the drop down menu and change it from NC to NO

Now the relay will not close on startup and will turn on when the setpoint has been reached.

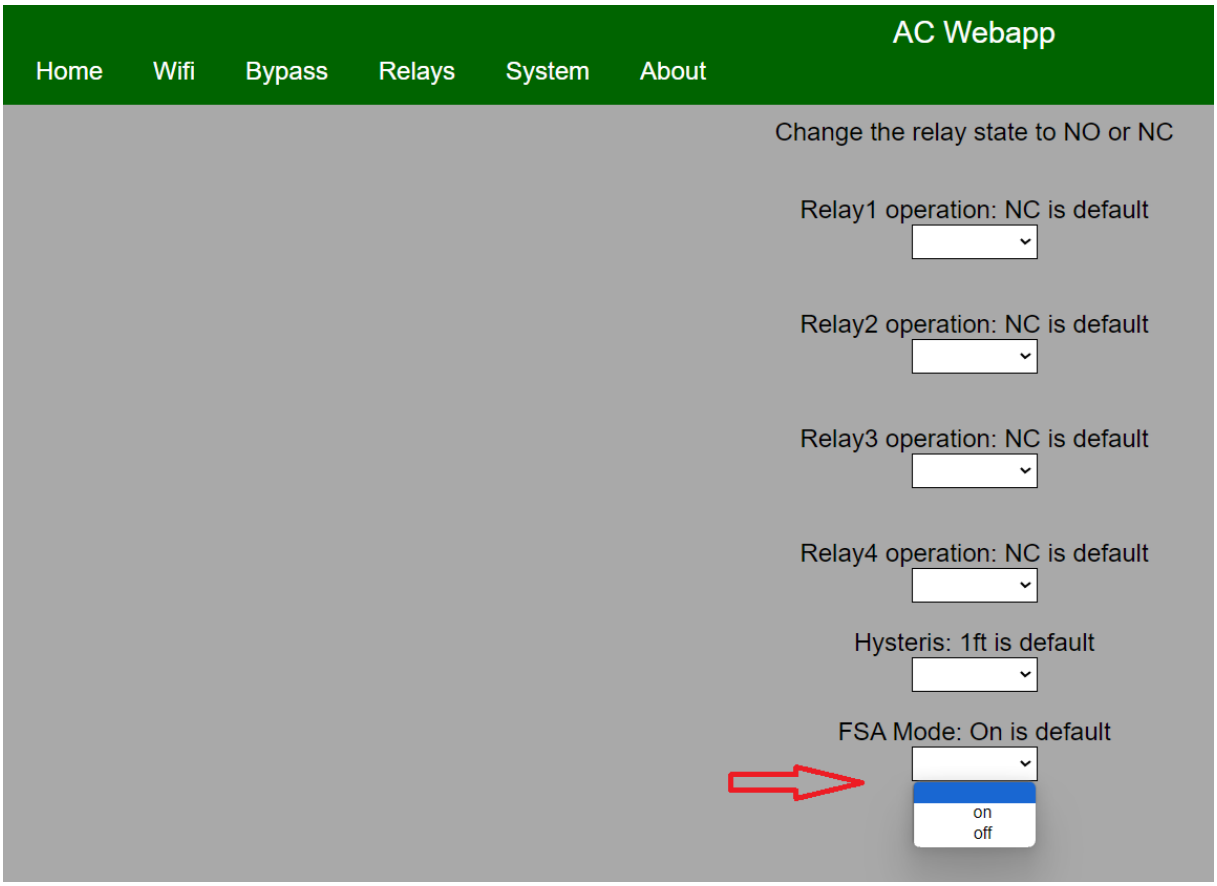
Hysteris: when the setpoint has been reached we add a hysteris so the relay will not continuously turn on / off when it is right at the edge of the setpoint. So for the relay to change state you need to be back the other way by default 1ft. if for some reason the reflection of is not stable and you have the signal bouncing more you can change this up to 5ft.



you change this setting until you find where the relay unwantedly is turning on / off to save the contacts of the LAC and the contactors / controls on the crane.

FSA mode: Full speed away mode is a feature that allows the crane to go fast in the opposite direction once it detects it is moving away from the crane we are avoiding. The program counts the distance readings to determine if it is going towards the crane or away from the crane. Once we determine we are moving away from the crane. Then we turn the high speed relay back on so the crane can move fast in the opposite direction without clearing the full setpoint. Example if the slow was set to 20ft and the stop was set to 10ft. once you hit the stop you have to travel 10ft in slow until it clears the slow zone. But with FSA on once you hit 11ft in the opposite direction to turns the high speed relay back on. Once you travel towards the crane again it will go back into slow mode.

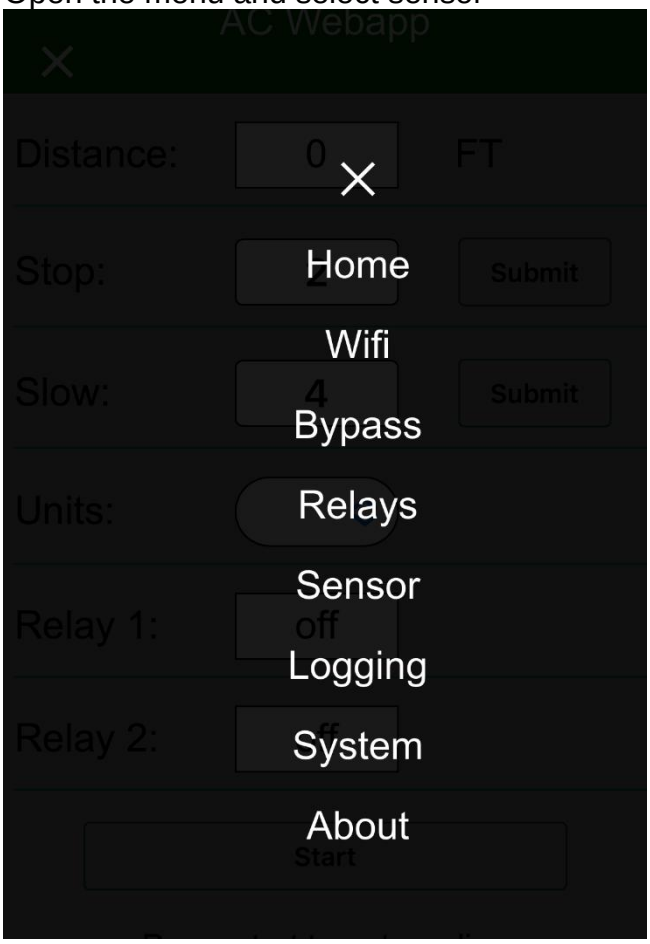
This feature is on in V2.6 and beyond. So if you don't want this to be on just go and turn it off. Then the system will operate within its setpoints regardless of direction.



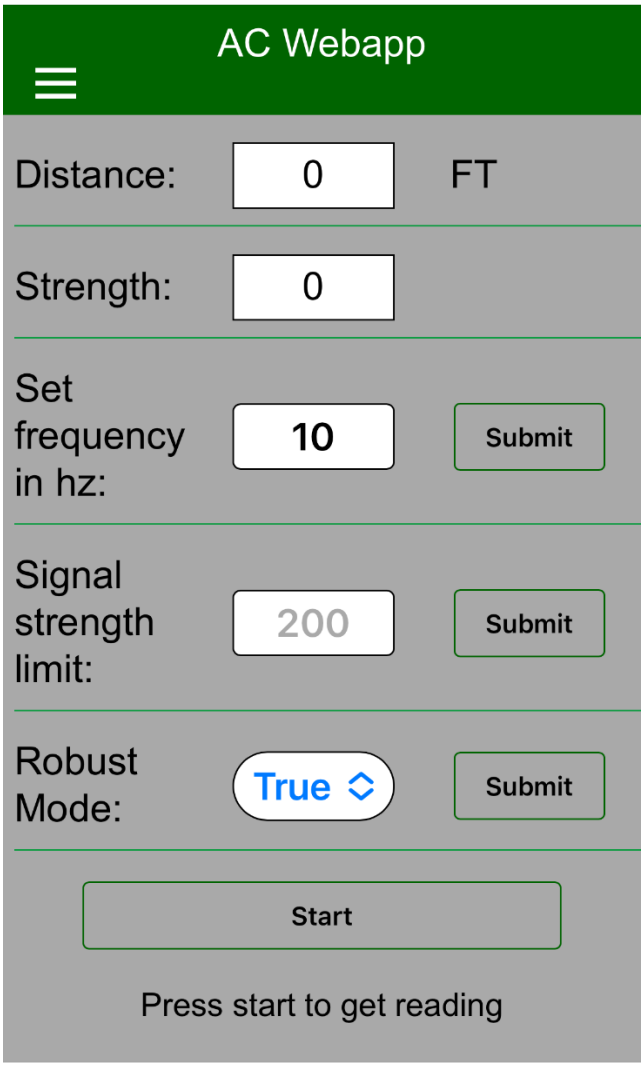
Sensor Page.

The sensor page is a new page to program and read more info from the sensors settings. This will now include the signal strength of the sensors reading, you will still see the distance on this page just like the home page. You will have the option to update the sensors read frequency. Default will be 10hz (10 reads per second) you can go as low as 1 hz or max 1000hz. There is also now a signal strength limit we can apply. This will help stop bad misreads due to the environment and any unwanted bad reads the sensor may get. Since the signal strength is determined by the reflectivity of the objects it sees this is not a 1 setting fits all applications. For example a white background object will have a much higher signal strength then a black object. We already have some filtering in the program to get rid of bad reads. For example if a good read is 30 and we get 1 reading of 4 we will ignore that 4. As we expect the next valid reading around 30 in the +- direction. We added Robust mode which makes the sensor get 2 good reads instead of one to strength the robustness of the signal. We can turn this on if we are in not optimal environments or applications to help stop bad misreads.

Open the menu and select sensor



When the page is open you will get this.



1.Press the start button to get the readings. You can update the values without pressing start if you know what you want to set it to.

2. the distance reading from the sensor

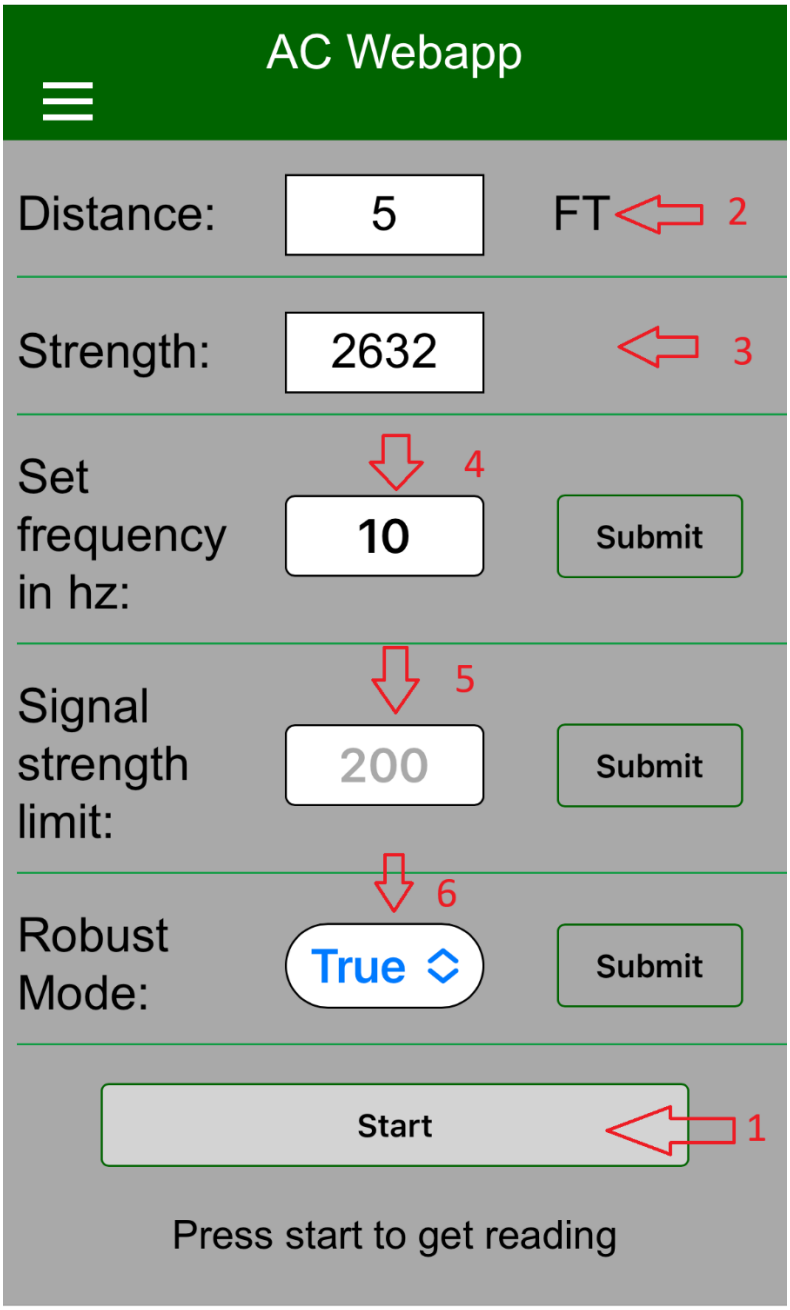
3. the signal strength from the sensor

4. the frequency setting choose between 1-1000hz and press submit. Note: the faster the frequency the more misreads could happen.

5.signal strength limit. If you have bad readings with no objects in front of the sensor at the desired ranges. Get the crane to the location you are getting misreads. Press the start button and watch the signal strength and distance. If the signal strength is low but about the default setting (350) but is enough to get a reading then change the signal strength limit to that value you are seeing plus a little bit more. Then if the signal strength is below that limit the system will ignore this value. Don't worry about

it affecting your good reads as if you get the other crane close you will see the signal strength will be much higher. But to double check you can get the crane in the slow an stop zones you want and check the signal strength at these distances.

6. The robust mode will add extra filtering to the system to make it so we get 2 good reads before accepting the distance value in the program. Its off by default.

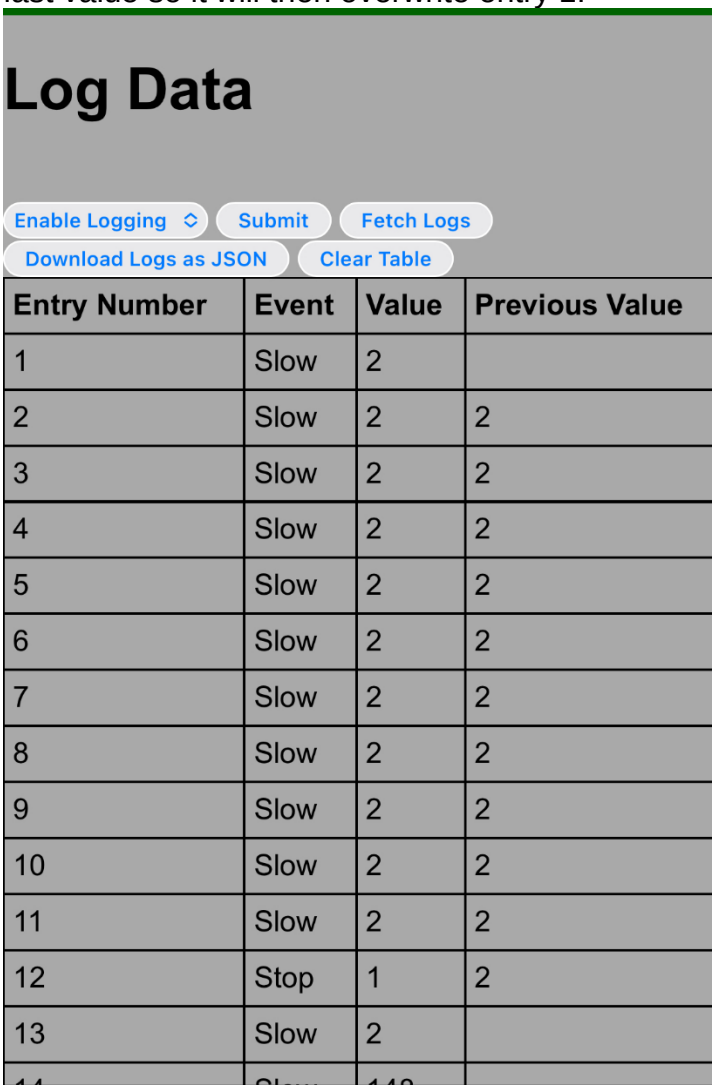


Logging Page.

If you find yourself in situation where once and a while your crane slows / stops when it shouldn't and you cant quite track down the reason. You can turn on logging so we can see the last 500 logs and try to see where the crane is getting bad reads and what they were. This feature is off by default as it decreases the performance a little bit of the system as it has some extra processing to do. Go to the log page. Then press enable logging and press submit.

Then the logging is activated. Now after some time where you see the relays have triggered you can open this page and click fetch logs. Here the data will populate. It will get the Entry number 1-500 then the event (slow or stop) the value (the distance) then the last registered distance value before the event.

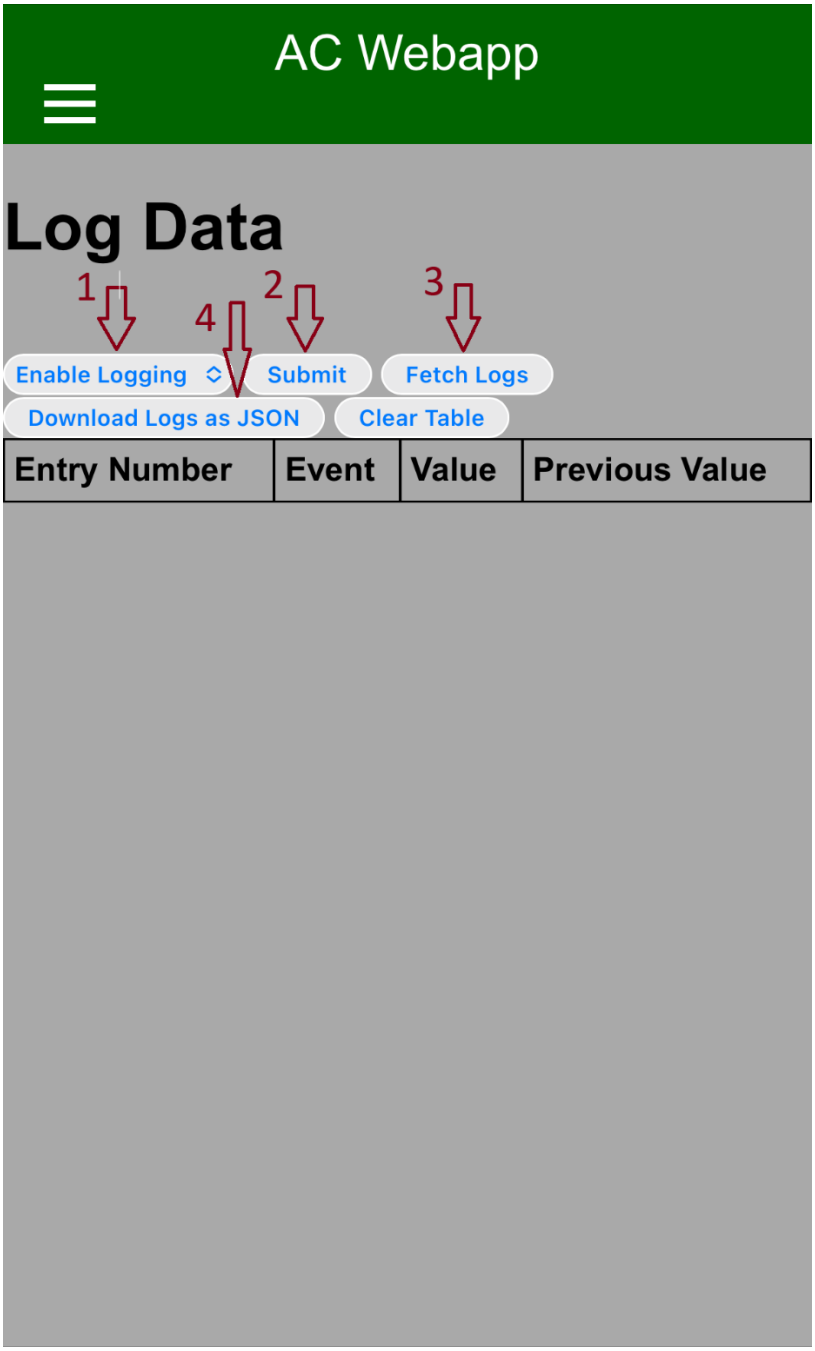
The system will log 500 events then overwrite its oldest data. Where entry 500 is the last value so it will then overwrite entry 1.



Entry Number	Event	Value	Previous Value
1	Slow	2	
2	Slow	2	2
3	Slow	2	2
4	Slow	2	2
5	Slow	2	2
6	Slow	2	2
7	Slow	2	2
8	Slow	2	2
9	Slow	2	2
10	Slow	2	2
11	Slow	2	2
12	Stop	1	2
13	Slow	2	

1. Enable logging
2. Submit to enable logging
3. After the logging has been running fetch the logs

4. Download the log values for future review.



7 Faults and troubleshooting

LED status light	Possible Problem	Output status	Solution if it is not in a normal condition
Green	The system is getting a distance reading beyond the current setpoints (e.g., setpoints at 5ft, reading at 10ft) and less then its out of range (e.g 12M)	All relays are on and the crane can travel in both speeds	LAC is receiving a reading but might be misaligned. Check what the LAC is detecting and realign accordingly.
Pulsing Green	The system is not receiving a return signal (e.g., other crane is farther than 39ft,12M)	All relays are on and the crane can travel in both speeds	Ensure the sensor is aligned with the other crane and that everything is level.
Purple	The system is in its first setpoint (e.g., slow setpoint is set to 10ft, and crane is 10ft or closer)	Relay 1 is on and relay 2 is off	Verify that the sensor is not detecting another object, such as a wall column if mounted close to the rails. Additionally, consider if the hysteresis hasn't reached its value yet. Double check the slow setting is correct

Light Blue	The system is in its second setpoint (e.g., stop setpoint is set to 10ft, and crane is 10ft or closer)	Relay 1 and 2 is off	Verify that the sensor is not detecting another object, such as a wall column if mounted close to the rails. Additionally, consider if the hysteresis hasn't reached its value yet. Check for debris on the lid,Double check the stop setting is correct
Red	System can't detect the sensor	Relay 1 and 2 will hold its last known state. e.g if the crane was far away Relay 1 & 2 will be closed if the crane was in the stop zone Relay 1 &2 will be open	The sensor may not be communicating with the motherboard. Check the connection; the plug might be loose, or the sensor could be defective. Consider replacing the system if necessary.
No light	System not functioning	Relay 1 and 2 are open	This could be due to a power supply issue/ cable is unplugged or cut or a faulty processor. Investigate the power source and processor functionality.

DANGER

ELECTRIC SHOCK

- Be sure to remove ALL power from ALL devices before connecting or disconnecting inputs or outputs to any terminal or installing or removing any hardware.
- Be sure to connect the grounding wire to a proper ground.

Failure to follow this instruction will result in death, serious injury, or equipment damage.

WARNING

FAILURE OF OUTPUTS

- If outputs should fail, outputs may remain on or off. Where personnel and or equipment hazards exist, use appropriate safety interlocks.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

8 Technical Specifications

8.1 General Data

- 0.1-12M Range
- Accuracy +- 1%
- FOV 3 deg
- LED sensor power consumption 85mW-550mW

8.2 Electrics/electronics

Function	Description
Digital inputs	• 1 optical isolated inputs • 120VAC input
Relay outputs	• 2 change-over relays • max 250Vac - 3A
Supply	• 90-230Vac ± 10% • optional 100-240Vac
Power consumption	• max 3W

8.3 Mechanical data

Function	Description
Dimensions	• 4.50 x 4.50 x 2.44 in / 114.30 x 114.30 x 61.98 mm
Mounting	• Thur hole
Weight	• 0.6 lbs
Housing	• PC/ABS

8.4 Ambient data

Function	Description
Temperature range	• operational : -10°C to +60°C • storage : -40°C to +85°C
Relative Humidity	• 10 to 95% (without condensation)
protection	• Nema 4X IP68

9

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