

Marine Canister {Automated Mobile Seabin}

Tarang Chandresh Mehta ¹, Mihir Ashish Kothari ²,
Satish Ramashray Yadav ³, Rupam Chandubhai Suriya ⁴,
Prof. Priyanka Tripathi ⁵

¹²³⁴⁵(Electrical Department, Atharva College of Engineering/Mumbai University, India)

Abstract: *The Seabin is a revolution in terms of technology to solve problems like marine waste, marine litter, and educate to prevent ocean and water bodies' pollution. The device moves up and down with the range of tide collecting all floating rubbish. Water is sucked in from the surface and passes through a catch bag inside the Seabin, with a submersible water pump, plugged directly into 12V outlet. The water is circulated inside the Canister & back into the marina leaving litter and debris trapped in the catch bag to be disposed of properly. This Project is far more than a product; as our final goal is to "Have pollution free oceans for our future upcoming generations". To achieve this we are working to make the canister upgrade and better in terms of affordability and reliability. Also, educating and raising awareness to be able to one day live in a world where pollution devices are not needed.*

Keywords: *Energy Storage, power stabilizing problems, energy savings, Plastic Pollution, marine pollution.*

I. Introduction

A full study should be undertaken by the facilities manager and Operational Company, to select which supplies of materials could benefit the owner by reducing the plastic waste and which supplies would give no commercial benefit. ^[1]This way the owner only purchases a set of Canister of the correct size and not one that's for all purpose. Installing a Marine Canister unit to 'optimize' all intakes of waste would give a longer return on investment, a higher capital outlay and makes complete commercial sense. It is possible to make a substantial human energy saving and also to increase the life expectancy of the aquatic life. Unfortunately the past recent years have witnessed a drastic growth in the plastic pollution. Reason being cheap to produce easy to utilize but the disposal issues have made its own stake of the owners who generate plastic. The marine infrastructure in India has been designed as per concrete consideration of its citizens. The reason is, it reduces the consideration charges, and helps to maintain the supply chain. Due to which all the companies have no other alternative but to produce plastic at sanctioned level. The best potential for saving is probably with older systems of production and garbage disposal with conventional control gear. Therefore older commercial and office premises are likely to have a better saving potential than modern buildings or industrial sites. The main problem with plastic is that it is used just once and then dumped away in the celestial water bodies ending up with marine oceans and degrading the life expectancy not only of humans but aquatic lives as well. The immediate solution to the problem is Marine Canister.

II. Common Fluid Quality Problems

A. Microbiological pollution

Bacteria and various water born viruses cause severe problems and may also contribute to various epidemic outbreak with causes involving diseases like cholera, typhoid etc. The main cause of this distress event is the microbiological imbalance that ends up polluting ^[3] the water and infecting the marine life including the humans who consume seafood or drink the contaminated water.

B. Oxygen depletion pollution

Some substances that are biodegradable which comes from agricultural waste and those coming from the industries enter the water bodies such as rivers and oceans. ^[4]The breakdown of these biodegradable substances breaks down, they use up the oxygen in the water.

III. Effects of Aquatic and Human Life

We have established various communities and have flourished with various sources of clean drinkable water since we have begun to admire nature. Sources of fresh water around the world are threatened around the world are threatened by water pollution. Not only are we managing our resources poorly through wastage, we are also thoughtlessly dirtying it.

These days when you try drinking untreated water your body will immediately react to it. At least you might get a stomachache. ^[5]Water borne diseases account for about 35, 75,098 each year. Most of the infectious diseases spread through water.

Lake, streams, rivers, oceans bodies and other small and large water bodies' account for most commonly observed surface water. The unaccounted level of water pollution caused by plastic is usually witnessed as it washes up on pristine beaches. ^[6]There are many types and causes of water pollution. Sometimes it is a natural occurring phenomenon whereas sometimes they are caused by micro organisms or altered unbalanced use and dispose of plastic waste. This list has no end to it as the pollutants have shown a newer and never decreasing graph of increment.

IV. Solution to problem

A. Using a Seabin



The Seabin unit is a floating debris interception device designed to be installed in the water of marinas, Yacht Clubs, ports and any water body with a calm environment and services available. Like the old saying portrays: IF WE CAN HAVE RUBBISH BINS ON LAND, WHY NOT HAVE THEM IN THE OCEAN AS WELL

The Seabin can catch an estimated 1.5 Kgs of floating debris per day (depending on weather and debris volumes) including micro plastics up to 2 mm small.

Water is sucked in from the surface through a cyclone and passes through a catch bag inside the Seabin, with a submersible motor capable of creating a tornado of 30.000 Kmph, plugged directly into 12 V outlets. ^[7]The water is then pumped back into the marina leaving litter and debris trapped in the catch bag.

The catch bag can hold up to 1 Kgs of debris and it is advised to

be checked twice a day and emptied as needed. The Seabin needs to be cleaned at least once per month and to be checked regularly.

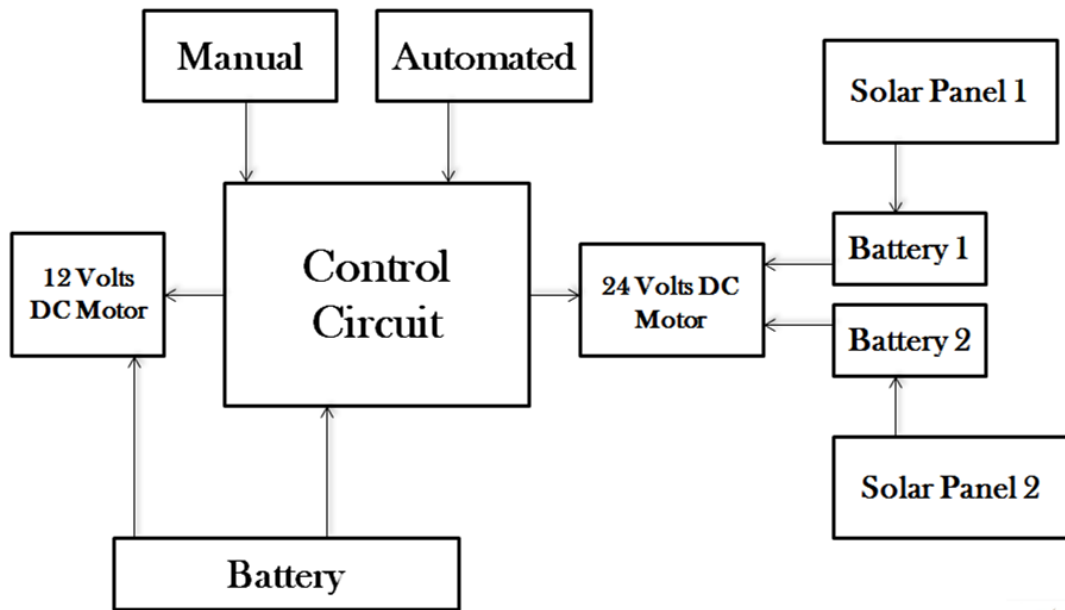
The Seabin can be installed in a specific "Debris problem area" in the coastal region on a floating dock. This strategic positioning enables the wind and the currents to push the debris directly to the Seabin.

The Seabin Project offers a simple and affordable solution to the global issue of ocean pollution. This automated floating rubbish bin collects garbage, debris, and even oil from the water, and may revolutionize ocean cleaning technology. ^[8]The systems are designed to operate constantly, 24 hours a day, 365 days a year, helping to create a better life for every living thing. The Seabin Project has been picked up by the global media, with interviews and articles on the revolutionary waste collector being released worldwide. The Seabin Project is a brilliantly simple waste disposal system that could easily be implemented in marinas around the world.

^[9]The founders have an Indigo campaign set up to collect funding so that they can begin large scale production of the rubbish bins and start "cleaning the oceans, one marina at a time."



Block Diagram



The Block diagram clearly depicts the functional block diagram of a Marine Canister. At first there are two batteries of 12V each both supplying power to the 24V DC motor. ^[10]These batteries also receive power from the mounted solar panels.

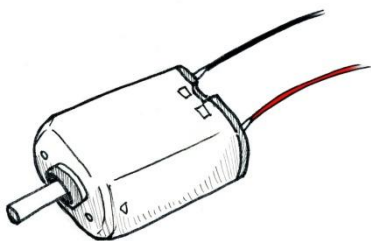
Another 24V Battery is dedicatedly used for supplying Control Circuit and another 12V motor. The motor is run using the control circuit in two modes:

- 1} Manual
- 2} Automated

The control circuit controls the motors and the control operation is performed by the Battery.

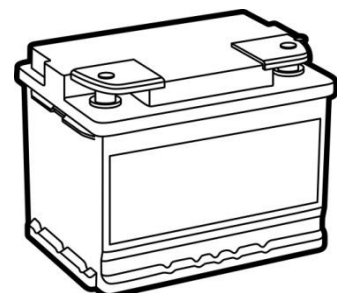
A bucket shaped container is being used for creating the cyclone. A tough, rigid & robust container that can withstand waves and wind and can be used in any weather conditions.

The actual resting voltage, or the voltage a battery will settle at 12-24 hours after being removed from the charger, is closer to 2.1 volts per cell, or about 6.4 volts for a 6v battery, and 12.7 volts for a 12v battery. ^[11] These numbers assume 100% healthy cells, and may vary a bit lower for older batteries.



A 12v DC motor is small and inexpensive, yet powerful enough to be used for many applications. Because choosing the right DC motor for a specific application can be challenging, it is important to work with the right company. ^[12]A prime example is MET Motors, which has been creating high-quality permanent magnet DC motors for more than 45 years.

Ardino Nano is a microcontroller board based on the ATmega328P (datasheet). It has 22 digital input/output pins (of which 6 can be used as PWM outputs), 10 analog inputs, ^[13] a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button.



V. Advantages of Marine Canister

- Diminishing the use of synthetic organic substances.
- Adds up to urbanization planning.
- Reduction in infectious diseases.
- Reduction in nutrient pollution.

- Will improve the air quality index.
- Easy installation – ^[14] no need to change battery, no rewiring require, no maintenance required, no moving parts.
- Comes with a 3-4 years warranty.

VI. Conclusion

It is a fit and forgets solution, which requires no change to lifestyle operation. The units operate on all circuits 24 hours a day, 7 days a week and no maintenance is required. ^[19]Installation is quick and simple with no change in battery supply needed. Savings in environment and protection against degradation are immediate with typical paybacks under 5 months.

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