

www.wave3d.co.kr



WAVE 3D

Intelligent Drone Sensors, Systems & Solutions

WAVE3D





WAVE 3D

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WAVE3D

Intelligent Drone Sensors, Systems & Solutions

Wave3D Co., Ltd. is the creative leading company based on smart drone sensors, systems and solutions. Annual average sales growth of Wave3D after Aug. 2015 has increased 50% and sales of last year grew by 9 hundred thousand dollars.

Recently, Wave3D company has researched And developed in field of AI service drones, Drone ESS and Educational coding drones. Our future goal embraces the innovative drone technology and connects creative people beyond the horizon.



Philosophy

3R

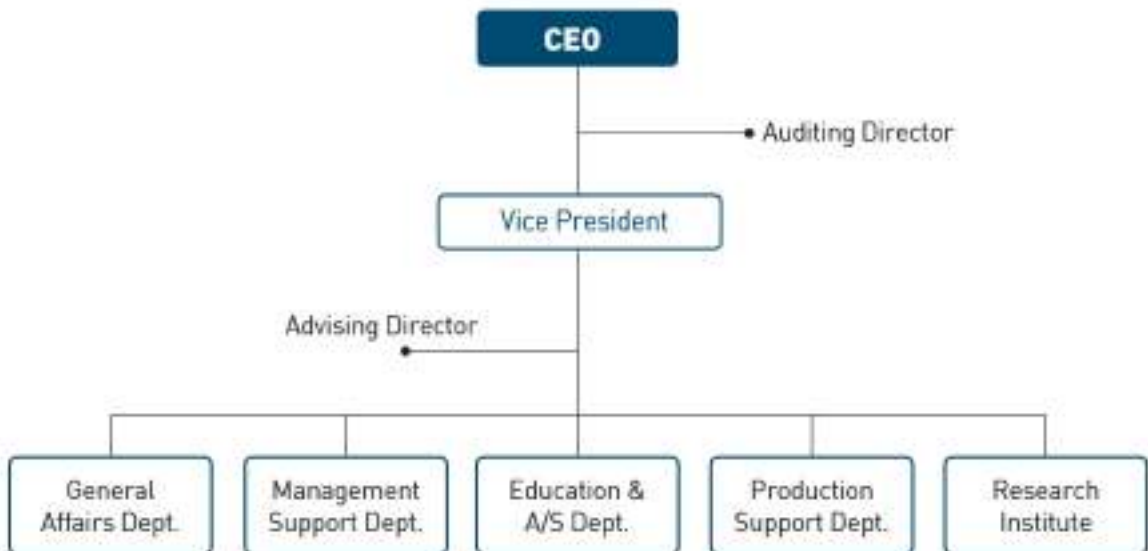
WAVE3D Co., Ltd. has three basic philosophies of 3Rs[Real Time, Real Space & Market, Real Human] for sharing human on time at space and market.



Company	WAVE3D Co., Ltd.
CEO	Kyung Sik Seo
Foundation	August 13, 2015
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Tel/FAX	+82-61-381-1966 / +82-61-381-1967
Sales	9 hundred thousand dollars [2017]
Homepage	www.wave3d.co.kr



Organization



History

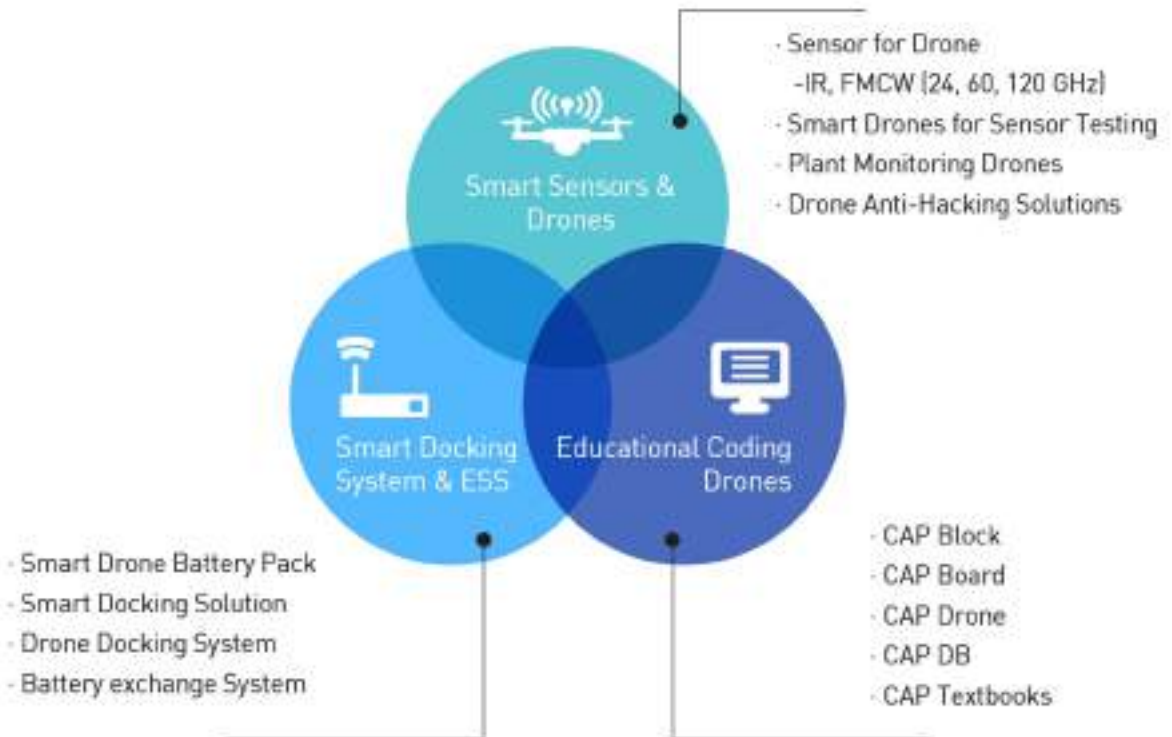
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|----------|--|
| 2015.08. | Established Wave3D Co., Ltd. |
| 2016.05. | Established Wave3D Research Institute |
| 2016.06. | Certified as a venture company |
| 2016.06. | National Research Fund Acquisition of Wind power Generator Facility Inspection (2 million won) |
| 2016.10. | Certified Jeonnam Defense Venture Company |
| 2017.03. | Certified Global IP Star Company |
| 2018.01. | Participated in CES 2018 (Las Vegas) |
| 2018.04. | National Resarch Fund Acquisition of Crop Growth Recognition Drone System (4.6 million won) |
| 2018.07. | Established Wave3D EU Branch United Kindom (London) |
| 2018.10. | Participated in Commercial UAV Expo 2018 (Las Vegas) |
| 2018.10. | Established Wave3D Mexico Branch (Mexico City) |



Main Technologies

Wave3D Co., Ltd. was focusing on smart drone sensors and systems based on RF radar sensors and flight controllers.

Recently, Wave3D company has researched and developed in field of AI service drones, Drone docking system & ESS and Educational coding drones.



Realize the Forth Industrial Revolution and
Connect times, Spaces & Markets, Humans

Marketing Areas

● Established ● To be established

DOMESTIC



GLOBAL



Smart Drone Sensors & FC

Drone Impulse Radar Sensor | Drone FMCW Radar Sensor | FC

Drone Impulse Radar Sensor

- The sensor can recognize up to 10 ~ 14m.
- The sensor is possible to measure at night without any change of ambient temperature with high accuracy.
- The sensor is possible to analyze the signal pattern of the sensing object.
- The sensor can scan distance constantly and transmit data to FC in real time



Drone FMCW Radar Sensor

- The increase and decrease of the bridge frequency can detect the moving distance and speed of the object.
- The distance of the subject is selected by calculating the time of the reflected wave.
- The direction of movement along with speed and distance is also measurable.
- The frequency band is higher than the UWB band and detection is possible up to 30m.





FC

- Collision Prevention
- Collision avoidance
- Facility (wind power generator , bridges, buildings, solar panel) distance maintaining scan
- Automatic flight using sensor data
- FC own development, peripheral devices can be used with various interfaces (SPI, UART, I2C, GPIO xBee)
- Core flight control module performing flight attitude control function
- Multiprocessing device structure of auxiliary flight control module that assists core flight control module by communicating with peripheral device (sensor, etc.)
- Quad, hexa, octacopter compatible

Specifications

- MCU : ATmega2560, ATmega128 (Dual MCU)
- IMU : MPU6000 Series
- MAG : HMC5883 Series or External MBN
- BARO : MS5611 Series
- IO Ports : GPIO, UART, SPI, I2C, xBee
- RC Protocol : 8Ch PPM Signal
- ISP Programmable
- Ublox M8N GLONASS compatible
- 433MHz Wireless GCS Connection
- Auto Flight Waypoint planning



Smart Test & Service Drones

Sensor Testing Drone | Plant Monitoring Drones

Sensor Testing Drone

As Wave3D's sensor testing drone is a quadcopter with stable hovering and running, it has optimized to test various sensors like radars, lidars, cameras, and so on. Also, it is possible for testing non-contact sensors like various gas, fine dust, and so on with constant distance.





Plant Monitoring Drones

Wave3D's plant monitoring drones have performed plant maintenance monitoring about bridges, buildings, wind power generators, sunlight generation panels and so on. They have approached to various plants with constant distance, monitored plant conditions like cracks using AI. Also, they have utilized to analyze crop growth recognition and to manage forests based on AI solutions.



Smart Docking System & Drone Battery Exchange System

Smart Docking System | Drone Battery Exchange System | Drone Battery Pack

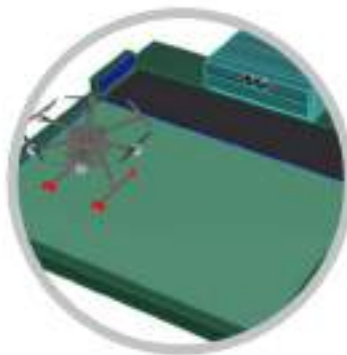
Smart Docking System & solution

Wave3D's drone docking system & solution has been performed to park drone destination safely using GPS, Radar, 3D positioning and camera technologies. Also, this docking can exchange 10 ~ 20 drone batteries automatically and conduct ground services with wheels.





Drone Battery Exchange System



Drones landing

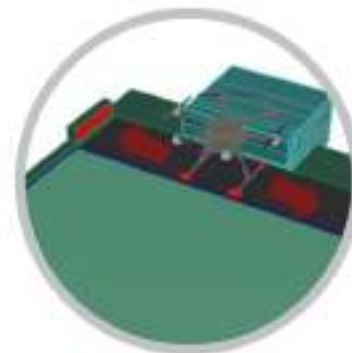


Move to conveyor belt by rear wheel power

Distance measurement with laser transmission to control drones

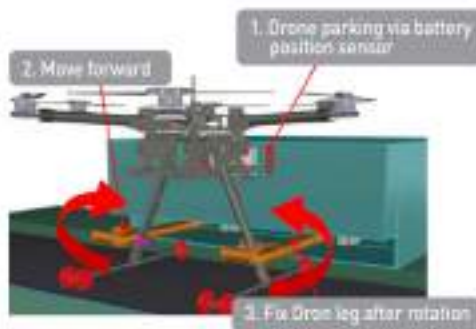


The laser stops at the end of the conveyor belt. At the same time, moving the conveyor belt according to the distance measured and the distance calculated by the control unit

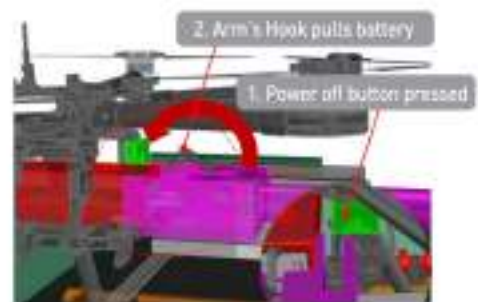


The drones move along the conveyor belt to the center control

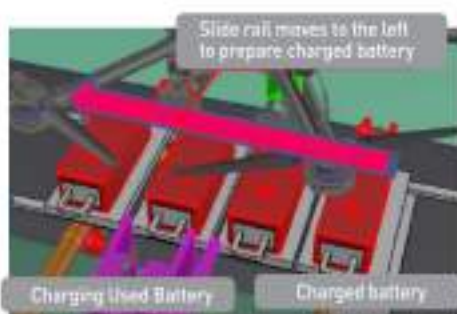
Automatic Battery Replacement



When the drones are parked in position through the battery position sensor of the control unit, the drones move forward and rotate 180 degrees to fix the drone legs.



As soon as the power is turned off, the arm for battery replacement goes out and holds the battery of the drone with a hook.



The slide is located where the battery is charging and waiting. The used battery moves to the left, and the charged battery reaches the arm. At the same time, the used battery starts charging.



The drones receiving the take-off signal operate the wheels in the opposite direction and travel a certain distance to the take-off and landing locations.

Drone Battery Pack

Wave3D's drone battery pack has needed to increase continuous drone work time of 150min - 300min with safely automatic drone battery exchange.



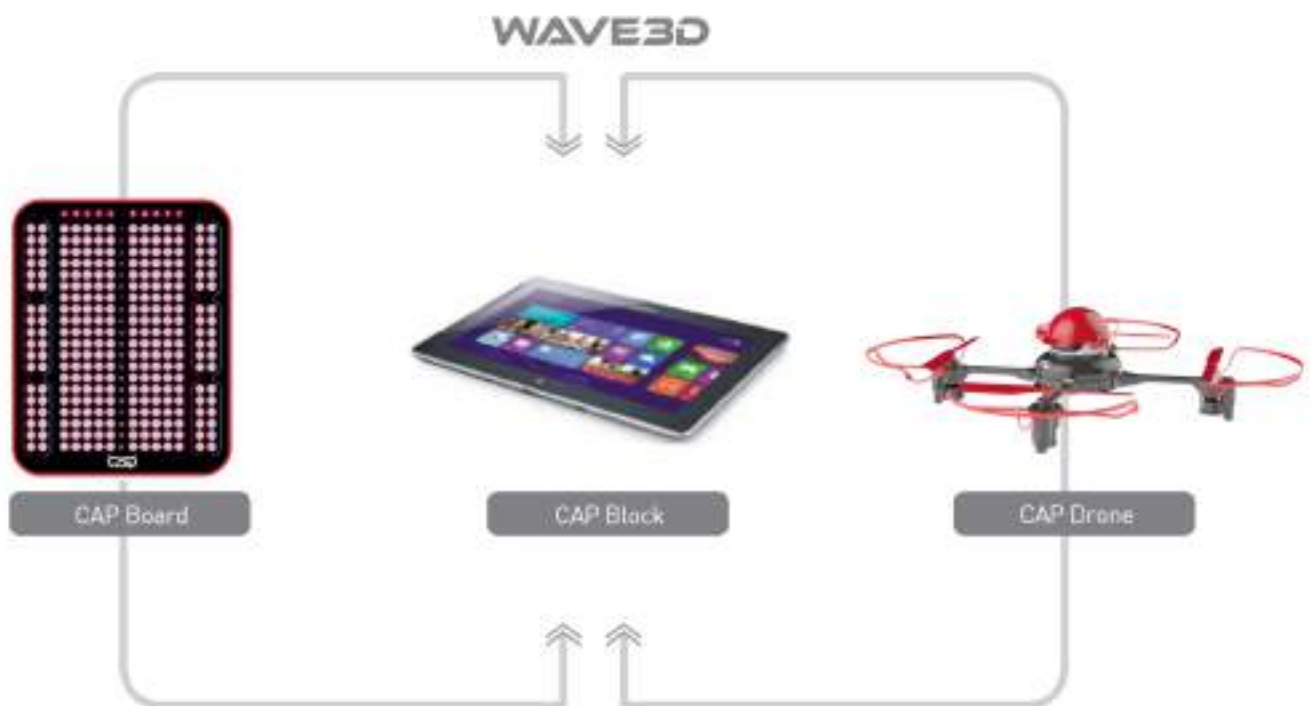
- Optimized BMS circuitry included
- Built-in 6S1P lithium polymer battery
- Can be used for automatic replacement of batteries for diagnostic drones as well as industrial drones
- Includes dedicated connectors and locks for easy insertion and removal

Educational Coding Drone Programs

CAP Block | CAP Board | CAP Drone



Wave3D Co., Ltd. has created creative educational drone systems and solutions based on coding access programs which have learned coding principles easily and systematically. CAP educational drone programs consist of CAP block of block coding, CAP board for control coding of drone components, and CAP drone of drone coding.





Educational Coding Programs

CAP Block

Cap Block is a block coding platform that anyone can learn and teach coding easily

Cap Block creates various access coding programs by combination of coding pieces

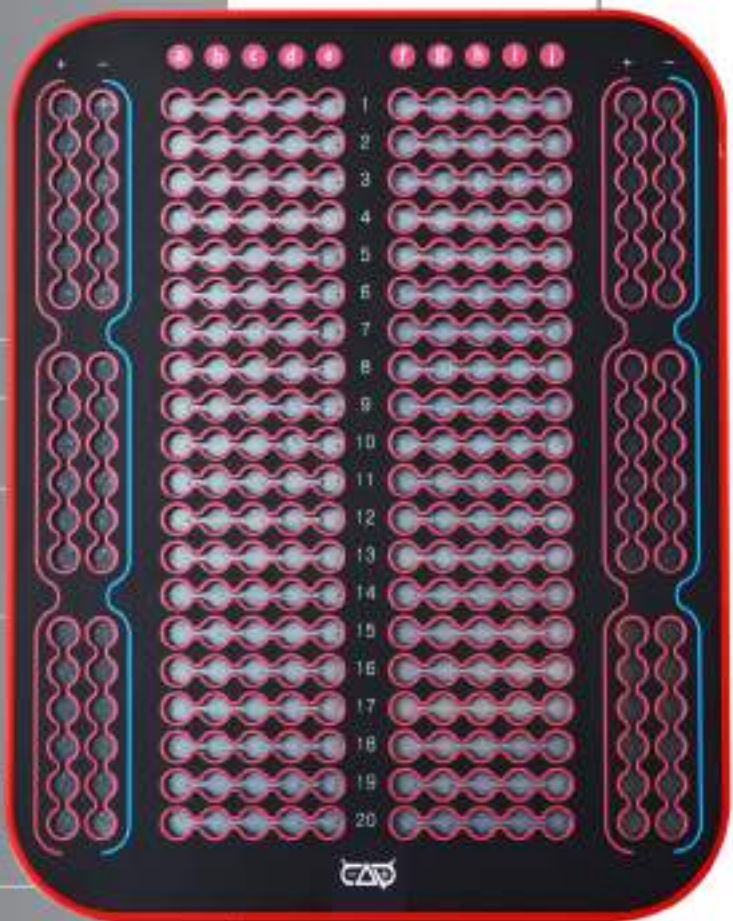




Educational Coding Programs

CAP BOARD

Students learning the CAP Board can control coding of drone components easily and systematically. Students can understand drone flight principles using propellers, LEDs, motors and so on.



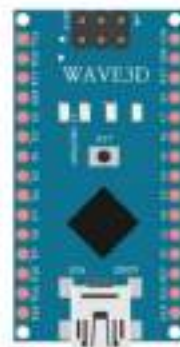
When the block coding program is connected to CAP Board, it is easy to see and convenient to practice.

The CAP Board is a large sized and safe product unlike the professional breadboard dioceses which uses the existing nail-sized parts and is made to see the children's coding program with easy eyes. All parts are equipped with neodymium magnets underneath to provide strong durability and bond strength.

The CAP Board provides a variety of educational coding solutions. Various contents can be produced using block coding, and it leads students to comprehend the mechanism of drones naturally.



Parts Configuration



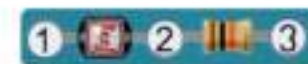
Micro Control board



Switch



Potentionmeter



Illuminance sensor



DC motor



Buzzer



3 Color LED



Black, Red, Green magnet Jump wire



Educational Coding Programs

CAP DRONE

Students learning the CAP Drone can control drones using block coding. CAP Drone consists of main control board using Bluetooth communication, drone body board, four motors, and so on. Also, CAP drone can mount style character of various hats and various mini sensors like mini cameras and mikes, 3D printer products and so on.



CAP Drone Structure

Wave3D's CAP Drone uses Bluetooth wireless communication unlike other drones. It can work with coding according to the user's preferred style, or it can be operated using a wireless communication controller using Bluetooth. Additionally, CAP Drones are robust and stable and can also take photos using camera module.



CAP Drone Specification

- Size : 31cm x 31cm x 9cm
- Weight : 140g
- Wheelbase : 23cm
- Propellers diameter : 13.2cm
- Battery : 900mAh Lithium polymer
- MCU, IMU, Bluetooth included
- Quick release propellers included





Educational Coding Programs

CAP DB

CAP DB has various coding access contents to learn drone software and hardware.

CAP DB is platforms connecting worldwide drone contents and human.



CAP Drone DB Platforms



CAP Block Contents



CAP Drone Contents I



CAP Drone Contents II



CAP Board contents



CAP Drone DB Platform



Human Manager



Personal Information Management



Course Level Management



Gallery



CAP Textbooks

CAP Block | CAP Board | CAP Drone



CAP Block Textbook



The CAP Block textbook explains how to code using blocks and how to create creative stories while creating various blocks and content.

Textbook contents

01. Principle of coding and description of block programs
02. Explanation of each block and easy operation examples
03. Contents of different degrees of difficulty which can be created with each block.

CAP Board Textbook



The CAP Board is available as an entry, scratch, and also compatible with Arduino module. The board and sensors can be electrically connected via jump lines consisting of magnets. CAP board textbooks contain a variety of content to help you understand and apply these sensors.

Textbook contents

01. CAP Board and Part Description.
02. Description how to set up a part such as a motor, light sensor or buzzer and how to code the block.
03. Description how to apply contents with the CAP Board and block coding.

CAP Drone Textbook



Drone textbooks teach you how to fly by block coding and provide a way to apply CAP drones to a variety of content while stably moving.

Textbook contents

01. Explanation of product configurations.
02. Explanation of drone operation with block coding.
03. Explanation of the Bluetooth wireless connection.
04. Play and training contents using CAP Drone.

WAVE3D

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