



# LG SONIC<sup>®</sup> MPC-Buoy

## Monitor, Predict and Control Algal Blooms

The MPC-Buoy combines online water quality monitoring, web-based software and ultrasound technology to provide state-of-the-art treatment against algae and cyanobacteria in lakes, dams and water reservoirs.



MPC-Buoy


## Looking for a Complete Algae Control Solution?

The MPC-Buoy is a floating, solar powered, platform that provides continuous online water quality monitoring to control algae by using ultrasound technology, thereby offering a complete algae control solution.

The system is designed specifically for the treatment of large water surfaces such as:

- drinking water reservoirs
- wastewater lagoons
- raw water reservoirs
- reservoirs of power stations
- irrigation reservoirs
- recreational lakes

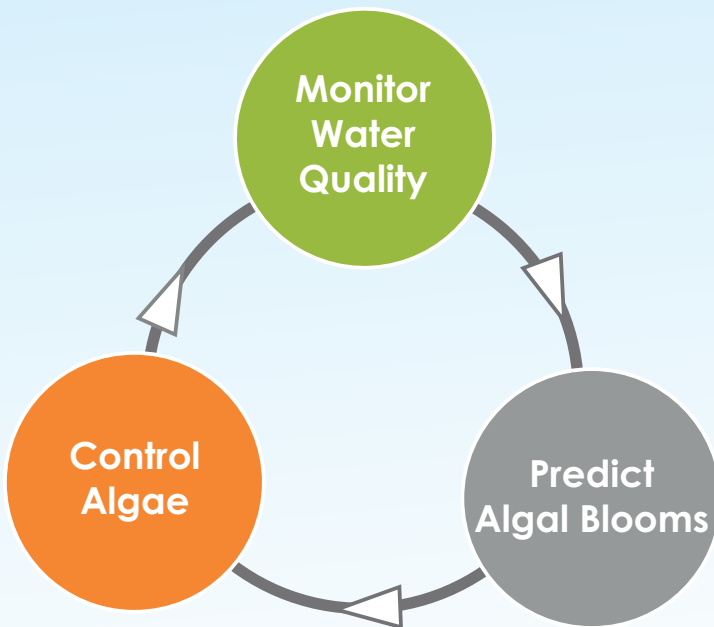
## The Advantages of our Technology

-  **Effective algae control**  
Eliminates up to 90% of existing algae and prevents the growth of new algae. Furthermore, the MPC-Buoy allows reduction of TSS, BOD, and chemical consumption.
-  **Effective on larger water surfaces**  
Each MPC-Buoy device can control algae in areas up to 500m/1600ft in diameter. Multiple buoys can be installed for large water surfaces.
-  **Safe for the environment**  
The ultrasound used by LG Sonic is safe for fish, plants, zooplankton, and insects. Our devices use of low power (5-20 Watts), wherefore no high voltage is transmitted into the water.
-  **Low operational costs**  
The system operates autonomously on solar energy and has an integrated Aquawiper to prevent frequent site visits.
-  **No release of toxins**  
The cell wall of the algae remains intact, preventing the release of toxins from the algae into the water.
-  **Easy to install and maintain**  
Can be deployed quickly and easily without the need for a crane. The system is easily accessible for maintenance while deployed.

# How the MPC-Buoy Concept Works

The MPC-Buoy contains detailed monitoring equipment, providing a complete overview of the water quality and controls the algae accordingly by using ultrasound.

## Monitor, Predict and Control Harmful Algal Blooms



Unique Chameleon™ technology adjusts the ultrasonic program to the specific water conditions

### 1 Monitor Water Quality

The MPC-Buoy provides a complete overview of the water quality by collecting the following parameters every 10 minutes:

- Chlorophyll a (green algae)
- Phycocyanin (blue-green algae)
- pH
- Turbidity
- Redox
- Dissolved oxygen (DO)
- Temperature

### 2 Predict Algal Blooms

The monitored data is delivered real-time through radio, GPRS or 3G to a web-based software.

By using a web-based software, a clear overview of the water quality will be provided.

Based on our developed **algorithm** we are able to modify the ultrasonic program to the specific water conditions and predict an algal bloom a few days ahead.

### 3 Control Algae

Based on the received information, ultrasonic transmitters are activated and/or optimized.

By using ultrasonic pressure, algae and cyanobacteria are controlled.

Ultrasonic pressure disturbs the buoyancy of the cyanobacteria, causing them to sink to the bottom and die.

# MPC-Buoy Features



1

## 4 ultrasonic transmitters for complete 360° sound coverage

- Treatment range of 500m/1600ft in diameter
- Integrated Aquawiper™, an automatic cleansing system for the ultrasonic transmitters
- Chameleon technology™ adjusts the ultrasonic program to the specific water conditions



2

## UV-resistant buoy construction

- Aluminum powder coated frame
- Corrosion resistant construction
- Unsinkable floats



3

## Floating solar system

- 3x 195 Wp high quality solar panels that provide power, all year-round in any country
- 1x 24 Volt, 40 AMP lithium battery



4

## Intelligent power management

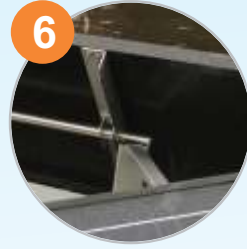
- During low battery charge, the system automatically turns off the ultrasonic transmitters
- Switches to energy-saving program during periods of low sun irradiation
- Overcharge and deep charge regulation to protect equipment



5

## Complete sensor package to measure water quality

- In-situ sensors to provide real-time data
- Monitors DO, turbidity, pH, chlorophyll a, phycocyanin, redox, and temperature
- Automatic antifouling wiper ensures optimal readings



6

## Construction allows for easy installation and low maintenance

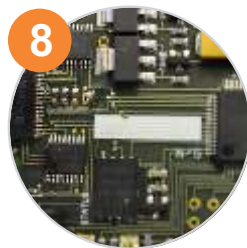
- Can be deployed quickly and easily without the need for a crane
- Easily accessible for maintenance while deployed
- Remotely managed and monitored
- Includes bird spikes and bird net



7

## Smart communication system

- GSM/GPRS Telemetry Quadband (850/900/1800/1900 MHz )
- CDMA (optional)
- Radio (UHF/VHF) (optional)
- GPS (optional)
- Iridium Satellite (optional)



8

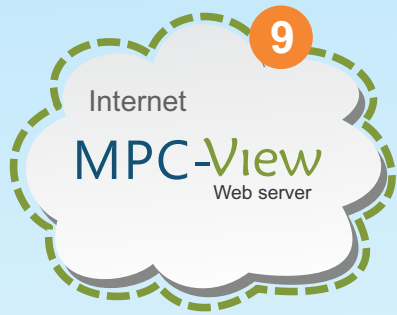
## Reliable data acquisition system

- 3-way communication between ultrasonic transmitters, water quality sensors and the web-based server (mpc-view)
- Universal input to customize monitored data
- Integrated alarm functions





9

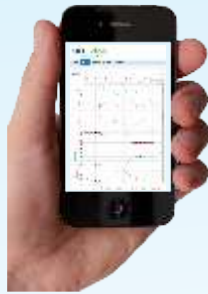


### Web-based software package (MPC-View)

- Customers can visually monitor water quality, and the status of the ultrasonic transmitters
- Employees of LG Sonic receive water quality data to verify the status of the lake and to modify the ultrasonic program



GPRS/3G  
CDMA



## LG Sonic

Employees of LG Sonic receive water quality data, verify the status of the lake and modifies the ultrasonic program.

- Biologists and ecologists from LG Sonic verify the status of the lake and modifies or activates the ultrasonic program based on the specific water conditions and algae present in order to prevent new blooms.

## Customer

Customers can visually follow the progress of the ultrasonic treatment and the status of the devices.

- The web-based software receives, summarizes, and publishes data into charts, tables, and sheets on a personal web page.
- Data about projects can be added, such as location of deployment and history of algal blooms.

GPRS/3G  
Radio (optional)



# Technical specifications

## Aluminium frame

Pre-assembled frame

## 3x solar panels 195Wp

Solar cell: Monocrystalline cell

Rated Power (Pmax): 195Wp

Weight: 16 kg

Connectors IP67

Size: 1580x808x35mm

## 1 x 24 volt lithium lifepo4 battery

24 volt

Capacity: 40 Ah

Weight: 15kg

## 3 x aluminum framed polyethylene buoy

Material: Rotationally-moulded UV-stabilized HDPE polyethylene

Filling: Closed-cell polyurethane foam

Buoy frame: Anodized aluminum

Weight: 15 kg

Size: 1200x600x200mm

Buoyancy capacity 95 kg

## Data acquisition system

Configurable time interval (default: 15 min)

4 x analog channel  
(user-configurable for either 4-20mA,)  
1 x RS485 port for instruments  
1 x high frequency pulse counting channel  
1 SDI-12 input  
3X RS232

## Water quality sensor package

### Fluorescence, including anti-fouling Wiper: chlorophyll a, phycocyanin, turbidity

470nm – Chlorophyll a  
610nm – Phycocyanin  
685nm – Turbidity

### Redox

Combined electrode  
(Redox/reference) :  
Platinum tip, Ag/AgCl  
AgAgCl.  
Gelled reference (KCl)  
Range - 1000 to + 1000 mV  
Resolution 0,1 mV  
Accuracy  $\pm 2$  mV

### pH

Combined electrode  
(pH/ref):  
special glass, Ag/AgCl ref.  
Gelled electrolyte (KCl)  
Range 0 – 14 pH  
Resolution 0,01 pH  
Accuracy  $\pm 0,1$  pH

### Temperature

Technology CTN  
Range 0.00 °C à + 50.00°C  
Resolution 0,01 °C  
Accuracy  $\pm 0,5$  °C  
Response time < 5 s

### Dissolved Oxygen

Optical measure by  
luminescence  
Measure ranges:  
0.00 to 20.00 mg/L  
0.00 to 20.00 ppm  
0-200%

## 4 x LG Sonic® e-line XXL algae control treatment (360°)

Remote selection of ultrasonic program

Number of ultrasonic programs: Unlimited

Remotely customize ultrasonic program

Ultrasonic range: up to 80 frequencies

Different programs per transmitter

Automatic Aquawiper to clean transducer surface

## Telemetry

GPRS Telemetry  
Quadband (850/ 900 /  
1800 / 1900 MHz )  
CDMA optional

Radio (UHF/VHF)

## Solar Charge Controller

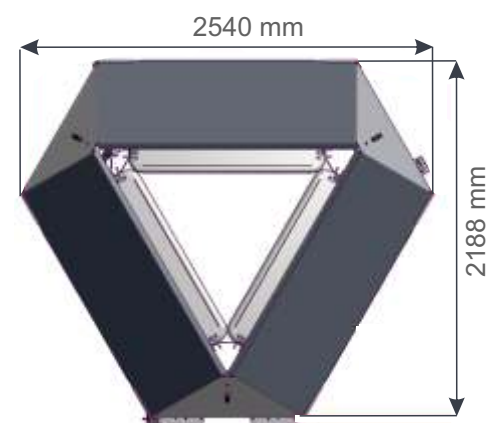
Overcharge and Deep  
discharge protection

Ip68 Protection



Total weight:  
160 kg

Top view →  
← Side view



# Testimonials

## American Water

**Description:** Installation of 4 MPC-Buoys in a drinking water reservoir at the Canoe Brook Water Treatment  
**Location:** the United States of America

"Extensive testing conducted during 2014 showed that the buoys had a significant impact on the algae, allowing the plant to reduce chemical consumption by more than 20 percent, and reducing the concentration of undesirable taste and odor causing compounds in the treated water delivered to customers".



AMERICAN WATER

## Bournemouth Water

**Description:** Installation of 4 MPC-Buoys in a drinking water reservoir (East Dorset Reservoir)  
**Location:** Longham Lakes, the United Kingdom

Tim Latcham, Head of Water Supply, said the system was installed in February and has been fully operational since March. "We're working closely with the supplier who is able to fine-tune the sound frequencies to deal with specific outbreaks of algae. "It's early days and we haven't hit the peak time for algae but following the first significant outbreak, we've already seen a dramatic reduction which is very encouraging," said Tim.

## Dŵr Cymru Welsh Water

**Description:** Installation of 1 MPC-Buoy in a raw water reservoir  
**Location:** the United Kingdom

"Martin Bradley, Head of Innovation for Dŵr Cymru Welsh Water, said: 'This is a new and exciting technology that has the dual advantage of being low capital cost and being solar powered, giving low operational costs. The environmentally friendly technology offers the potential of algae removal using ultra sound, resulting in an improvement in the water quality'.



Dŵr Cymru  
Welsh Water

## Clearwater PMPC-project

**Description:** Installation of 2 MPC-Buoys in the Skrzyneckie Male Lake  
**Location:** Poland

The level of cyanobacterial (blue-green algae) cells in the Kórnickie Lake, which is located in the same area as Skrzyneckie Male Lake, was nine times higher compared to the lake in which the MPC-Buoys were installed. The local inhabitants also noticed visual improvement in water quality, stating that the water in the lake has become cleaner and no algae scum occurred after the deployment of the two MPC-Buoys.

# Award-Winning Innovation

**Global TAG Excellence Award 2015** for most developed technology from ISLE Utilities

**Business Achievement Award 2015** from Environmental Business Journal for algae control project with American Water

**Shell LiveWIRE Award 2014** from Shell and the Dutch Chamber of Commerce

**WssTP Water Innovation Award 2014** from Water Innovation Europe

**Engineering Solutions Award 2014** from the Institute of Water Innovation Awards

# Frequently Asked Questions

**Q: What maintenance is required with the MPC-Buoy technology?**

**A:** The sensors and ultrasonic transmitters on the MPC-Buoy are all equipped with Aquawipers™ to keep them clean. This keeps the efficiency and specificity of the MPC-Buoy optimal and makes frequent maintenance to the system unnecessary.

The sensors have to be returned to LG Sonic once a year for maintenance and calibration.

**Q: I want to install an MPC-Buoy, but I don't have access to a crane or a big boat at my lake. Can I still install the Buoy?**

**A:** Yes, the MPC-Buoy is a modular unit that is easy to assemble and install. The Buoy can be assembled at the shore of the lake and easily pushed into the water. Because it is light, all it takes is a small boat to drag it to the center of the lake.

**Q: Can I install the MPC-View software on my own server instead of LG Sonic's server?**

**A:** Yes. The MPC-View software can be installed on any Windows server you choose. We do advise to provide LG Sonic access to the server in order to enable us to change the ultrasonic programs, based on the water quality.

**Q: I have blue-green algae in my lake. Won't the installation of the MPC-Buoy release the toxins from the cells and create a problem?**

**A:** Whenever blue-green algae are blooming, toxins can always be present in the lake, even when the water is not treated. The **LG Sonic**® itself does not rupture the cells, neither does it cause cell lysis. Instead, the concentration of algae in the water will slowly decrease along with the concentration of toxins in your water and the bad smell. Thus, no drastic increase in toxin concentrations will occur after installing the MPC-Buoy.

**Q: I have a lake that is larger than 500 meters in diameter, can I still use the MPC-Buoy technology?**

**A:** Yes, each MPC-Buoy has a range of 500 m in diameter (50 acres). When a lake is larger than this, a combination of buoys can be used. Because water quality monitoring is not necessary every 500 meters, it is possible to install multiple MPC-Buoy models without additional monitoring packages. This way, the MPC-Buoy provides a cost effective solution for algae control, even for large lakes.

**Q: Do you provide ultrasonic treatment without the use of a floating solar system?**

**A:** Yes, this system is called the MPC-Grid. This is a smaller version of the Buoy, because it does not include the solar panels and batteries. The power is supplied via a 24VDC cable to the float. This unit can have a variable amount of transmitters and strengths to fit any type of water surface. Ask LG Sonic to prepare you a customized quote for your system.

**Q: Do you provide water quality monitoring without the ultrasonic devices?**

**A:** Yes, We can help you with any water quality sensors for your type of water body.

**Q: Can I also buy the MPC-Buoy without water quality monitoring?**

**A:** Yes, this is called the MPC-Buoy lite. It contains 4 ultrasonic transmitters, a web-based software package, interactive algae control services, a floating solar system, and a buoy construction.

**Q: Can the MPC-Buoy provide power all year round in any country?**

**A:** Yes, the Buoy is equipped with three 195 WP solar panels and the batteries provide 3 to 5 days of autonomous power. This makes MPC-Buoy perfectly capable to provide power all year long, anywhere around the world.

**Q: What is included with the MPC-Buoy?**

**A:** All the parts mentioned in the [Technical Specifications](#) are included with the MPC-Buoy. Because the mooring depends on the type of lake, water depth and climate, this needs to be arranged locally.





# LG SONIC

Leading in ultrasonic algae control



*"Over 10,000 LG Sonic® algae control products have been successfully installed in a wide range of applications in 52 different countries"*

**LG Sonic B.V.**

**Radonstraat 10  
2718 TA Zoetermeer  
The Netherlands**

**T: 0031- 70 77 09030**

**F: 0031- 70 77 09039**

**[www.lgsonic.com](http://www.lgsonic.com)  
[info@lgsonic.com](mailto:info@lgsonic.com)**