



Floating measurement platform for monitoring surface water

Environmental monitoring

Using the spectro::lyser spectrometer probe from s::can, a variety of parameters were monitored in the Großer Woog swimming lake in Darmstadt to detect changes in water quality at an early stage.



e.Ray Europa GmbH

Parameters:

- TSS / Turbidity
- Color
- TOC / DOC
- BOD / COD
- NO₃-N / NO₃
- HS⁻
- O₃
- CLD
- UV254
- Fingerprints
- Spektral-Alarms
- Temperatur

Facts & Figures

Customer:

e.Ray Europa GmbH

Location:

Darmstadt, Germany

Application:

Surface Water Monitoring

s::can Partner:



GWU-Umwelttechnik GmbH

Key Products:

spectro::lyser and con::cube V3

Background

As part of a pilot project of the Smart City project „Schlaues Wasser Darmstadt,“ a WAMO 300 from the company e.Ray was used in the Großer Woog natural swimming pool. The WAMO is a floating platform that is solar-powered and can transmit position and water level in real-time via satellite navigation with centimeter accuracy. Using the spectro::lyser, a variety of parameters were measured in the lake to detect changes in water quality at an early stage.

Challenge

The monitoring of surface waters is complex because samples must be manually collected and then analyzed in the laboratory, which is often only done once a year. However, bodies of water are constantly changing due to climate and climate change, as well as anthropogenic inputs, which can in turn lead to greenhouse gas emissions and species extinction. All of these dynamic developments can only be inadequately captured by individual samples.

s::can's Solution

To comprehensively and continuously monitor water quality, the spectro::lyser spectral probe was used in conjunction with the con::cube at Großer Woog. The spectro::lyser can measure a variety of parameters that are important for balancing surface waters. For example, using the parameters Chlorophyll A and turbidity, an algal

bloom caused by blue-green algae (cyanobacteria) can be detected early and preventive measures can be taken.

Benefits

The s::can probe and the mobile platform WAMO from e.Ray provide an ideal package for the permanent monitoring of surface waters. The WAMO can provide uninterrupted power to the probe through a combination of photovoltaics and battery. Multi-channel communication makes remote data access possible. The probes are protected in the WAMO and automatic cleaning is supported, making monitoring very low-maintenance.

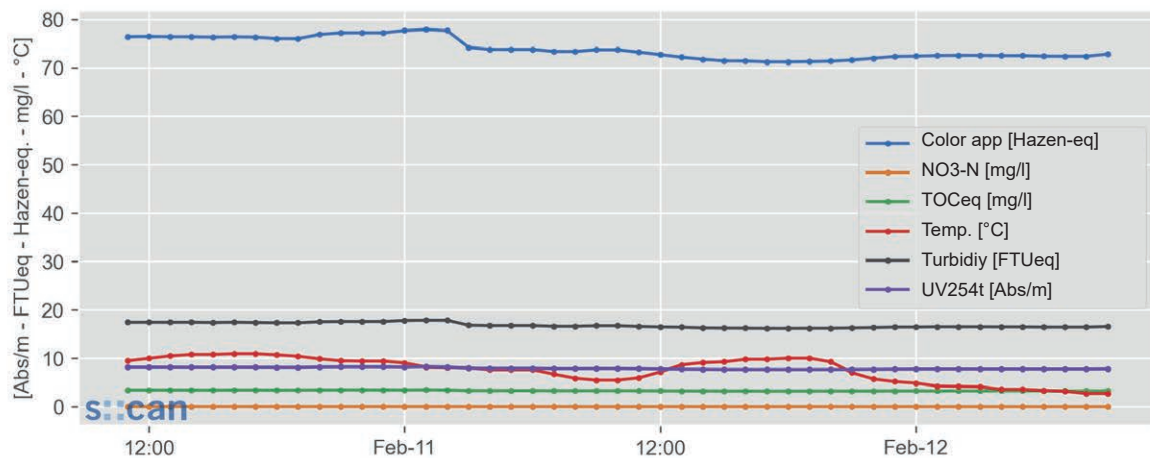
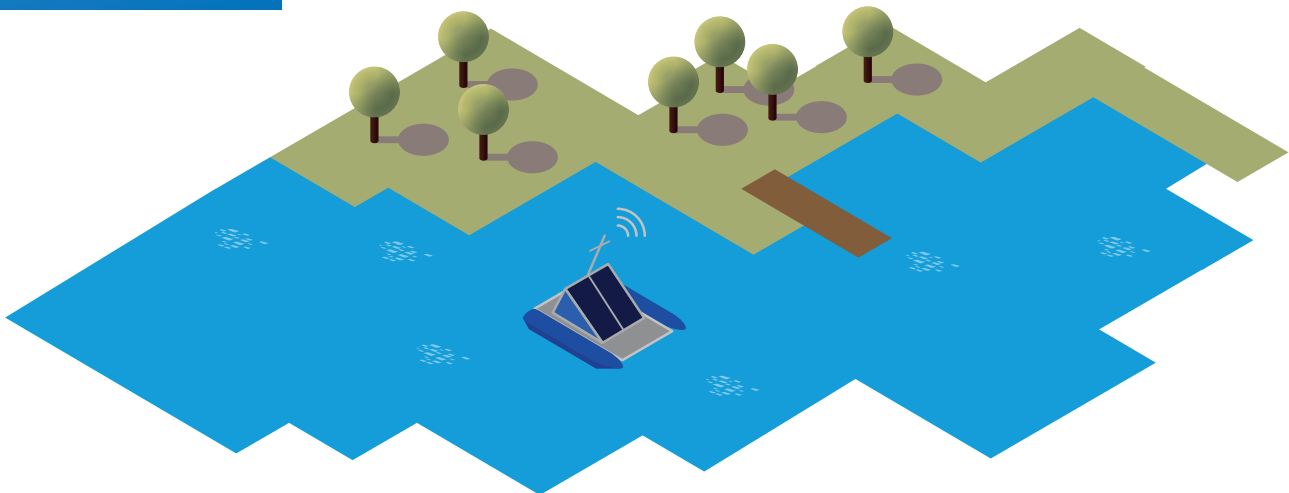
The satellite-based, centimeter-accurate water level and position measurement is not only advantageous for water data collection but also in flood scenarios.



„[...] it is very flexible to use and therefore important for many bodies of water in Hesse and throughout the Federal Republic Germany and beyond [...]“

Jochen Partsch, Mayor of Darmstadt

Process overview



A excerpt of the water quality measurement data from the Großer Woog natural swimming pool in February 2023, with hourly measurement of the parameters color, NO₃-N, TOC, temperature, turbidity, and UV254.



The con::cube is a compact and versatile terminal for data management and control of measurement stations. Due to its low power consumption, it is possible to operate the con::cube using solar panels. WLAN and optional worldwide WCDMA-4G interfaces enable wireless data transmission.



The spectro::lyser is a UV-Vis spectrometer that measures absorption in the range of 190-750 nm. Algorithms calculate water quality parameters from the spectral raw data. The spectro::lyser does not have any moving parts and, as it is a purely optical measuring device, it eliminates the need for reagents, leading to extremely low operating costs.



The WAMO platform floats on top thanks to its patented anchoring system, providing real-time data with centimeter-level accuracy even during high water levels. The WAMO can be used in all surface waters and offers a cost-effective way to monitor water quality development in order to take timely preventive measures.