



## Monitoring sea water quality and detecting industrial spills with spectro::lyser titanium pro at Xiangshan Harbor

### Coastal Seawater Monitoring

spectro::lyser titanium pros mounted on buoys are used for marine environmental monitoring in China. Ningbo University's College of Ocean researches offshore area organic pollution. The s::can system provides them with reliable real-time data about the quality of the seawater.



### Ningbo University

#### Parameters monitored:

- COD
- Turbidity
- Temperature

#### Facts & Figures

**Company/Institution:**  
Ningbo University

**Location:**  
Xiangshan Harbor, Ningbo, China

**Application:**  
Coastal seawater monitoring

**Key Products installed:**  
spectro::lyser titanium pro, ruck::sack pro and con::nect

### Background

The Xiangshan Harbor is located on the coastline of Zhejiang. The province of Zhejiang's main manufacturing sectors are electromechanical industries, textiles, chemical industries, food and construction materials. Xiangshan Harbor is a semi-enclosed bay with a catchment area of 1445 km<sup>2</sup> and the largest aquaculture base in Zhejiang. In recent years industry, agriculture and aquaculture have developed rapidly. Due to the increased sewage discharge the water quality of Xiangshan Harbor is getting worse and red tide occurs frequently. The eutrophication of the coastal water has created great attention.

Real-time monitoring of COD was needed to reflect the dynamic changes of various influence factors of the ocean's pollution, forecast pollution trends, avoid oil spillings and red tide disasters, improve the marine ecological environment quality and speed up the handling of environmental emergencies.

### Challenges

The harsh marine environment requires instrumentation that survives the saltwater and high concentration of Cl. Seawater corrosion is a common problem in similar installations. Another challenge is the attachment of microorganisms, like algae, fungi and shellfish.

Without proper cleaning microorganisms can cover the optical window, which impacts the measurement result. Due to the remote installation on buoys an automatic cleaning system was needed, that does not consume a lot of energy. Furthermore the impact of the high temperature, humidity and salty air on the electronic parts was a challenge.

### Solution

Two buoys were equipped with s::can systems. The spectro::lyser titanium pro with its durable titanium housing is used to prevent corrosion caused by saltwater. A 2 m mounting bracket fixes it to the buoy, so the spectro::lyser titanium pro is measuring 1,5 m under the sea level.

s::can  
titanium pro



To keep the optical windows automatically clean and keep the measurements accurate, a ruck::sack was installed. With its rotating brush and low power consumption it effectively controls fouling. The MIL connector and con::nect controller are sealed into a PE tank with integrated power and communication interface. The tank does not need to be opened for commissioning, calibration and maintenance.

### Benefits

The s::can system allows real-time water quality monitoring of a remote offshore area. It provides accurate online measurement data for the environmental monitoring network and seawater COD monitoring which are used for the scientific research and help to find solutions to fight the organic pollution of the seawater of Xiangshan Harbor.

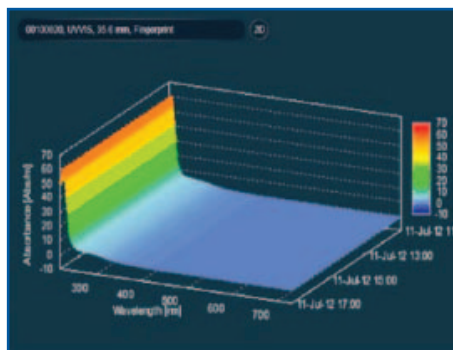
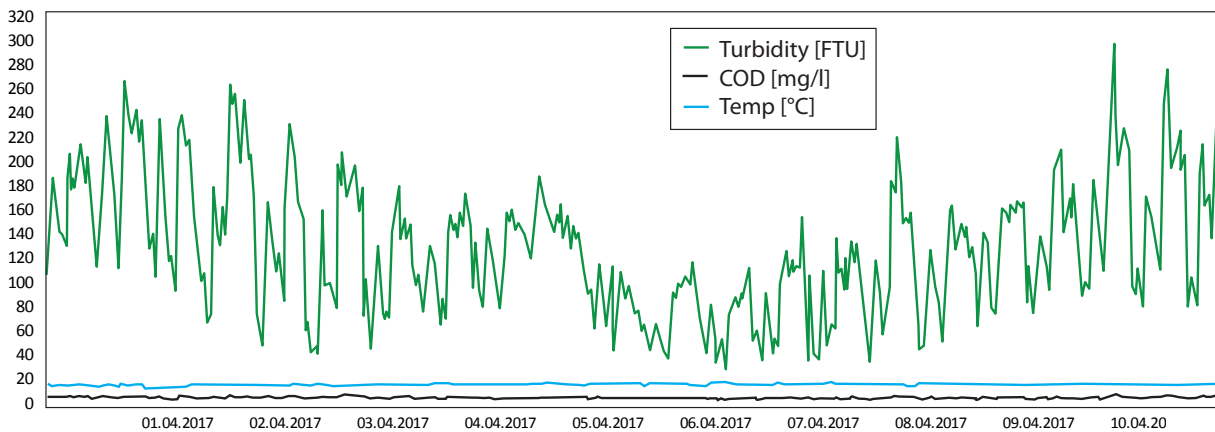
**“The spectro::lyser titanium pro provides us with the necessary data for scientific research and gives us evidence for offshore area eutrophication and red tide.”**

Professor Yongjian Xu,  
Ningbo University

**Process Schematic**



**Turbidity, COD and temperature measurements from the spectro::lyser titanium pro**



The s::can spectro::lyser titanium pro is a fully submersible UV/Vis spectrometer that measures light absorbance between 190-750 nm. s::can's specialized proprietary algorithms analyze and decompose the spectral data to measurements for many wastewater parameters: NO<sub>3</sub>-N, COD, COD<sub>f</sub> & TSS. Its enhanced specifications and titanium housing make it ideal for industrial applications.

The moni::tool software is a revolutionary platform for the management of measuring stations, online probes and analyzers. Whether it is installed in a large monitoring network or as a standalone station, moni::tool's intuitive software and state of the art features are an essential backbone for sensor and station management.

Ningbo University is a key university in the Zhejiang province of China. It was established in 1986 and consists of 19 faculties and colleges offering 6 PhD programs, 135 master programs and 71 bachelor programs. The number of its full-time undergraduate students amounts to 25,000.