



Life-saving remote 24/7 monitoring of nitrate concentration in drinking water

Drinking water monitoring

The drinking water quality of Parma in Italy is monitored online with a spectro::lyser, con::cube and chlodi::lyser. The s::can system helps to safeguard the water quality at all times.

IRETI

Parameters monitored:

- NO₃
- Chlorine Dioxide
- Temperature

Facts & Figures

Company:
IRETI

Location:
Parma, Italy

Application:
Drinking water

s::can Partner:
Isoil Industria spa



Key Products installed:
spectro::lyser, con::cube,
chlodi::lyser

Background

IRETI manages the integrated water service in 265 municipalities of Emilia Romagna, Liguria and Piedmont, where it operates in the areas of water supply, sewerage and purification of waste water. With approximately 2.8 million inhabitants served, IRETI is today one of the most important operators of integrated water services in Italy.

Through an aqueduct network of over 23,000 km, IRETI introduced over 290 million m³ of water into the managed areas in 2018.

Challenge

The city of Parma, located in the Po valley in a predominantly agricultural area, is affected by a problem common to areas where fertilizers are used. From time to time, the nitrate concentration in the groundwater is slightly higher than the maximum values of 50 mg/l allowed by the Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources. Hence the need for online control to have an alarm in case of anomalous situations, so that immediate and appropriate countermeasures can be taken.

s::can's solution

After a successful trial of the s::can products a long term measurement system was implemented to further evaluate the NO₃, Chlorine Dioxide and Temperature levels. The system consists of a spectro::lyser and the Chlorine Dioxide sensor chlodi::lyser, which measures the chlorine dioxide level of the used disinfectant. Both have been added to the control unit con::cube already in use which is able to manage up to 64 parameters for

various online analysis needs. Subsequently, a good correlation between online and laboratory data and the minimal maintenance requirements due to automatic brush cleaning, fulfilled the user's need for a smart water monitoring system.

Furthermore, s::can provided a dedicated software solution, making an overall management of water quality parameters including all the substances that absorb in the UV-VIS range possible. This feature allows the integration of the online monitoring system into the Water Safety Plan (WSP) as required by EU regulations and implemented in the Italian legislation.



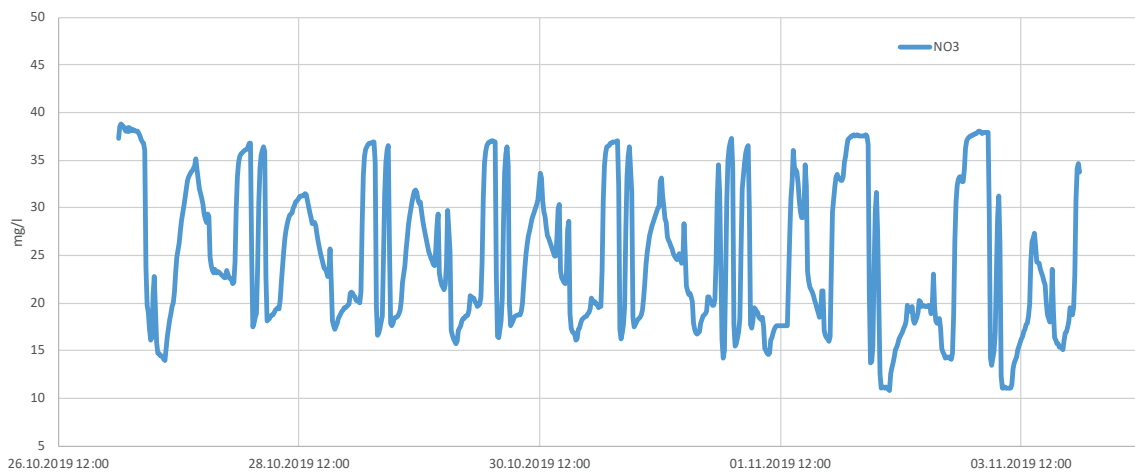
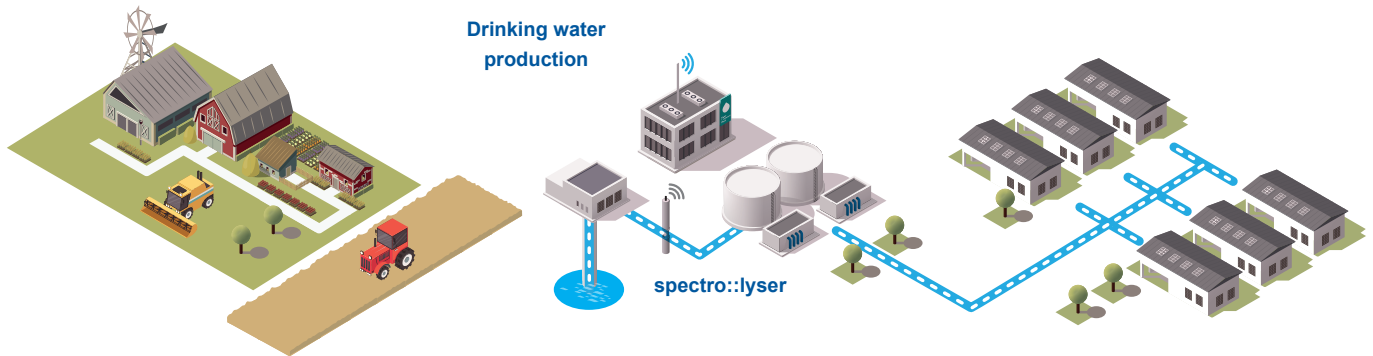
Benefits

The s::can system provides continuous 24-hour monitoring which makes it easy to take counter measure in the case of an abnormal event. The strong points of the installed spectro::lyser and chlodi::lyser probe are undoubtedly the high measurement frequency and virtually no maintenance. The high measurement frequency allows for more precise data, while the minimum maintenance means practically zero operating costs. All in all, the s::can system gives instant information about the water quality condition, which can prevent harmful effects on people's health.

“The spectro::lyser probe has positively amazed us for its accuracy and stability. This has granted such a dependable and safe online measurement, which makes the frequent discrepancies we used to have by comparing instruments data to lab values dissolve.”

Valentino Piramide, Manager of Emilia Region at IRETI S.p.A.

Process schematic



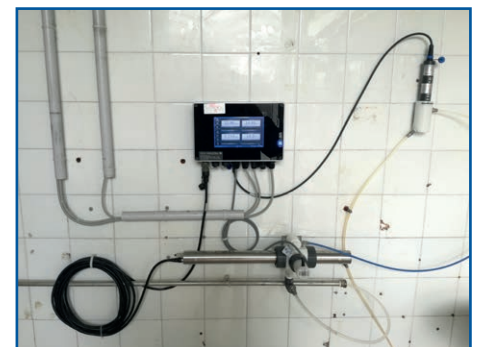
The diagram above shows NO₃ measurement data for one week. It is clearly visible that the concentration can change quickly. Online monitoring with the spectro::lyser in real-time ensures, that immediate countermeasures can be taken when needed.



The s::can spectro::lyser™ is a fully submersible UV/Vis spectrophotometer which measures light absorbance between 190 – 750 nm. s::can's proprietary algorithms analyze and decompose the spectral data to provide measurements for many water quality parameters. There are no moving parts in contact with the water and no reagents are used, resulting in almost zero operating costs.



The chloidi::lyser is an amperometric sensor for monitoring chlorine dioxide. It is ideal for all kinds of water treatment and produces stable readings even at high fluctuations of pH, temperature and flow. Strong surfactants are tolerated and the chloidi::lyser is not cross sensitive to chlorine.



The s::can system, consisting of a spectro::lyser, the chloidi::lyser and a con::cube, is monitoring the application 24/7 and has an event detection system in case of an abnormal event happening. The high measurement frequency and the very low maintenance costs make the system perfect for every drinking water application.