

## Surface water monitoring systems

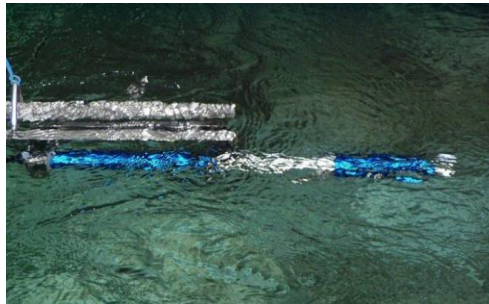
Surface (river, lake, sea) monitoring systems are designed to provide a continuous monitoring of river pollution on remote locations. Beyond monitoring of pollutants the monitoring site must be well suited to determine also the necessary additional parameters (like river flow) and to obtain a representative sample characteristic.

The typical monitored pollutants are:

Basic parameters	Single components	Complex components
temperature level pH redox DO conductivity Turbidity color Velocity Mass flow	Total N NO <sub>2</sub> NO <sub>3</sub> NH <sub>3</sub> Total P PO <sub>4</sub> Mn Mg Phenols heavy metals cyanides Simple hydrocarbons oil in water Fe Cyanides	TOC COD DOC BOD oil in water toxicity

State of art technology is allowing to apply complex electrode based and spectrometric systems submerged in the water. In this case there is no need to take water sample from the monitored water. The analytic system is dived into a representative location below the water surface on a way to be easily possible to take it out for inspection and maintenance.

The monitored pollutants are not only the basic pollutants like pH, DO, conductivity, ORP turbidity, etc, but also complex ones as COD, TOC, hydrocarbons in water, nitrates ammonia and others.



In case of more complex monitoring systems where phosphates, sulphates, sulphides, heavy metals and some other „difficult“ compounds must be monitored, shelter mounted analytic systems must be applied.

Important part of these systems are the sample inlets which must drive the water from a characteristic location into the shelter. Appropriate submerged or shelter mounted suction pumps must be implemented. The intake tubing must be heated to avoid freezing.



*Pumps are heavy, water stream is strong...*

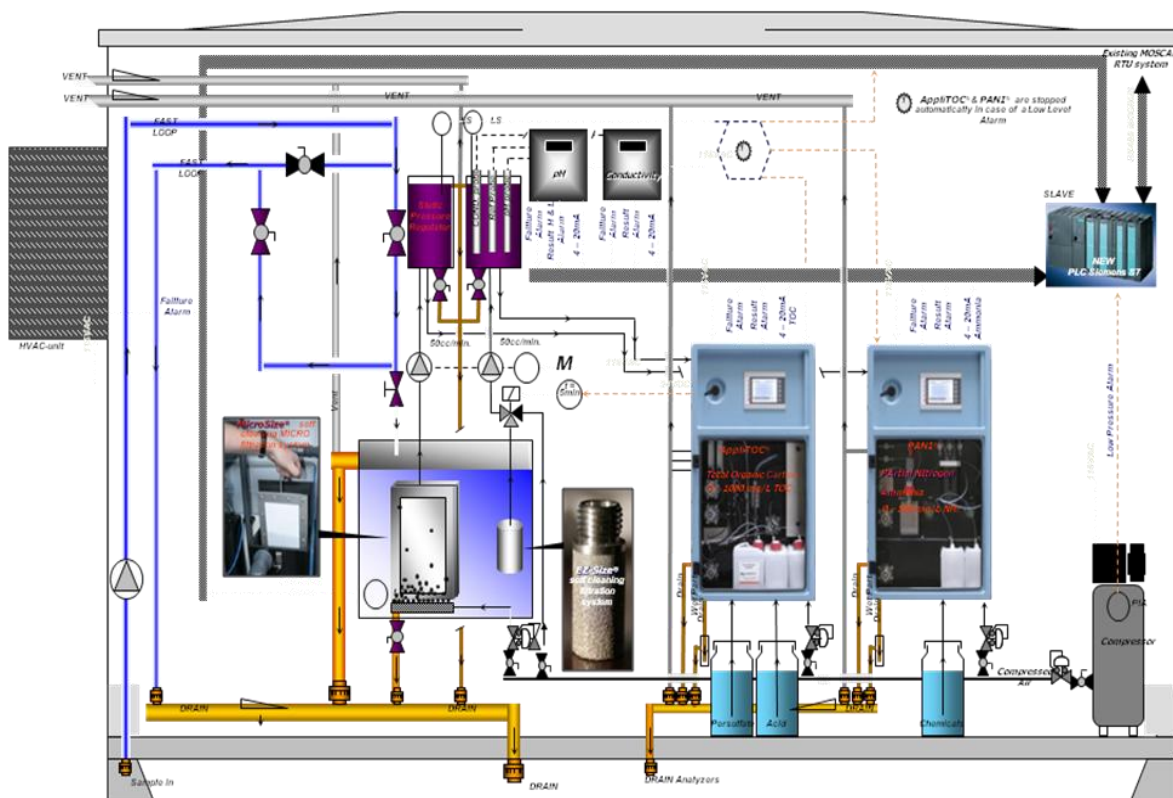


The water sample pumped into the shelter installed analytic system must be filtered to make sure that the water is clean enough to fulfill specifications of sensitive titrimetric and colorimetric analyzers to achieve optimal accuracy and stability of the overall system. The system must be resistant against fine mud experienced usually in flood situations.

### *Self Cleaning Filtration System*

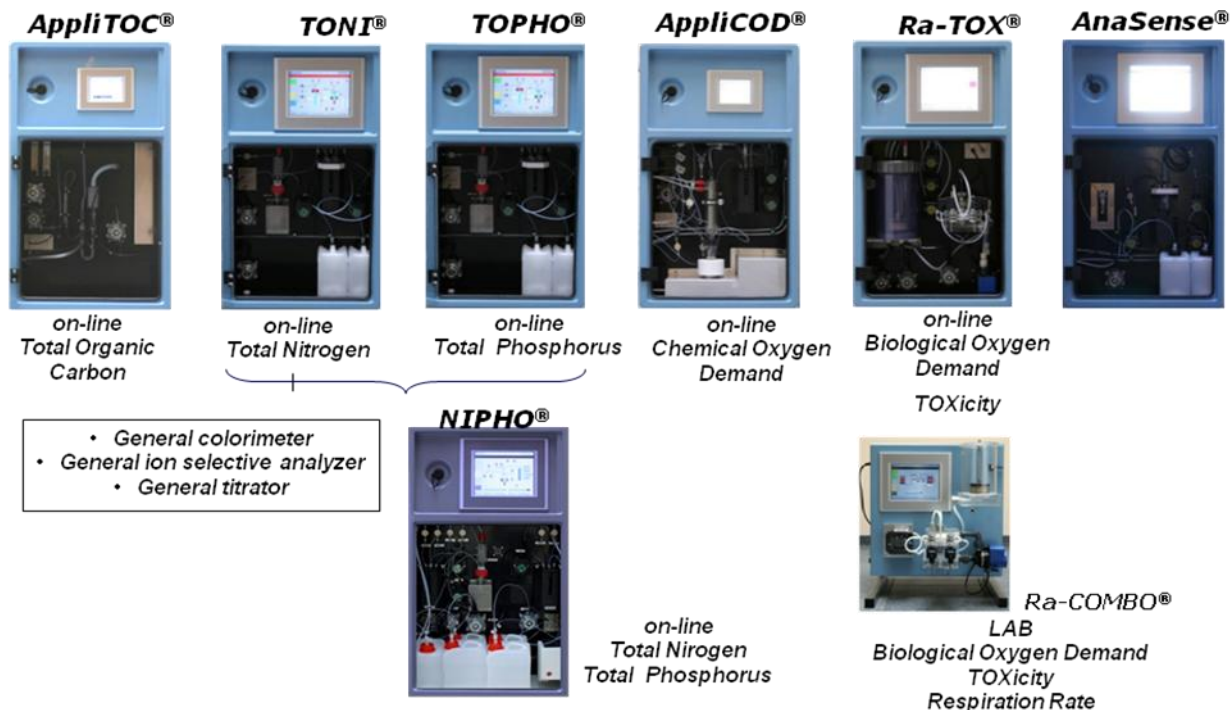


**Self Cleaning Filtration System**



The shelter integrated monitoring system is a pretty complex assembly.

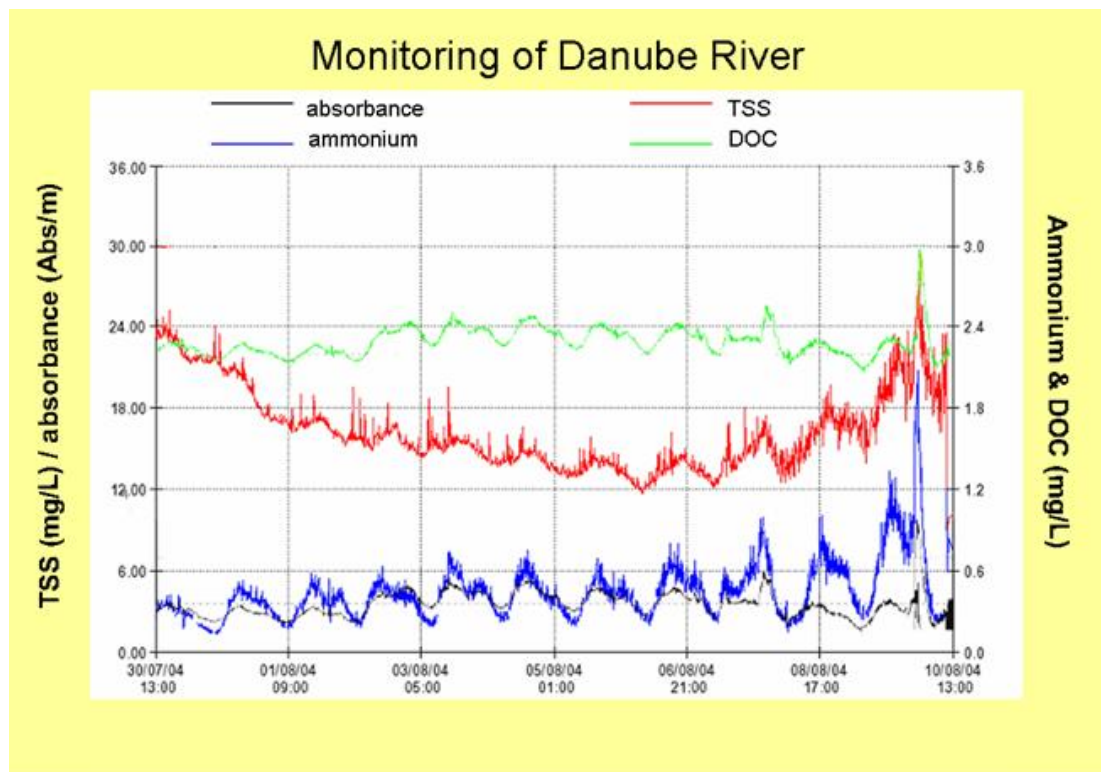
The most often applied analytic instrumentation for the „difficult“ pollutants are:



The monitoring station certainly besides the pollution analyzers needs also a station control system activating cleaning procedures, taking characteristic samples, protecting the station and certainly creating data files.



Data must be sent into a central station where complex data files are created.



Water quality monitoring stations must be always “tailored” to meet the local conditions not only in terms of the requested pollutants, but also to be resistant against local interfering mechanical, chemical or biologic compounds.