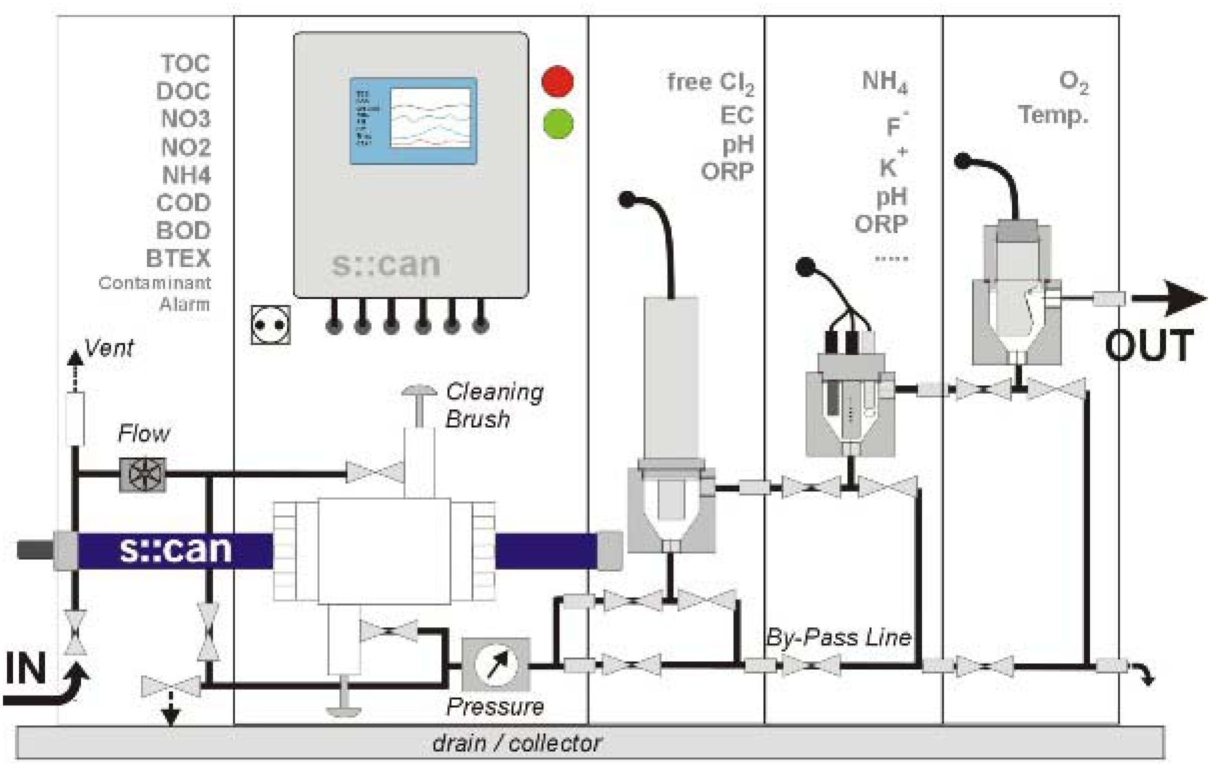
WATER SECURITY

Water Quality Monitoring Station

The s::can Water Quality Monitoring Station – a modular combination of one s::can terminal, several s::can probes and flow-through-cells – minimizes the complexity of water analysis to Plug & Measure Monitoring.

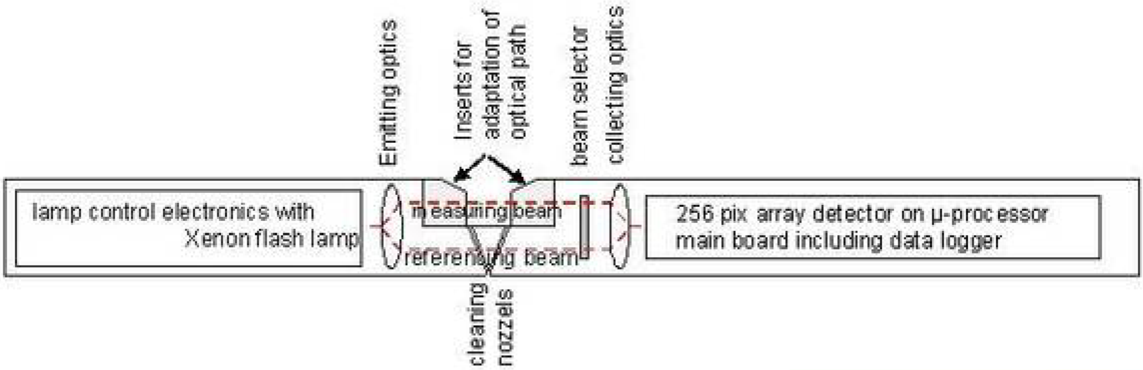
Find **here** more information

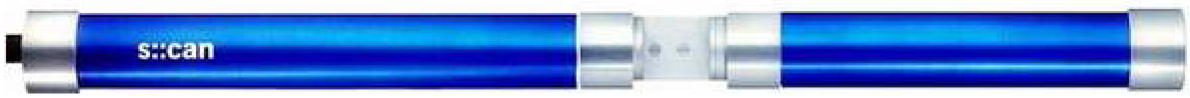


Hardware: The spectro::lyser™

The s::can spectro::lyser™ is an extremely sensitive submersible UV-Vis-Spectrometer with 100 mm optical pathlength. The instrument size is 500/44mm at 1,1kg. There are no moving parts - it is not even serviceable - and is built to run without ever leaving the water, at almost zero operating costs. The interface is digital (RS485/Modbus) and can be connected to any PC or SCADA system. The instrument is available with full stand-alone capability (integrated data logger and battery), or as a part of a network of autonomous solar-powered field stations, providing the telemetric control and data transfer from several field stations to a central data bank, accessible via any web browser.

The patented 2-beam optical design ensures drift-free measurements over many months. It works by blasting UV light from a high-energy long-life Xenon lamp (left) directly onto the liquid. The Zeiss 256 pixel diode array detector at the opposite side monitors the entire optical spectrum - from deep UV to the visible - and with the help of advanced chemometric algorithms running in the onboard mini computer, the smallest amounts of various pollutants can be quantified, even in a complex matrix.





Software: ana::larm

ana::larm is the product of 3 years of intensive development, with contributions from several university partners, research institutes. It has been developed specifically for contaminant alarm systems based on thousands of spectra, and is successfully used in several applications in Europe. The training of the alarm parameters can be done by the instrument automatically, or is done manually guided by the PC software. It allows for a very simple half- or fully automatic setup and configuration of up to 8 spectral alarm parameters within a few minutes. It will react on any type of organic contamination that provides an absorption signal in the UV range. The alarm sensitivity for many organic contaminants is between 1 and 500 ppb. At the same time it is most insensitive to any fluctuation of the matrix within the natural "normal " range, and thus keeps false alarms to an unmatched minimum. The approach and methods used are absolutely new and unique, and will open a completely new perspective for water monitoring beyond the trending of "classical" concentration parameters. Compared to other online monitoring instruments on the market, we feel that the spectro::lyser in combination with the alarm software module provides today's best possible protection against any kind of "abnormal" water composition or contamination.

Technical features that are relevant for alarm systems

Quick response to suspect quality changes ?

The standard measuring time is 30 seconds, but can be reduced down to 5 seconds. The absolute response time depends on the time needed for the evaluation of alarm algorithms, in connection to other sensors involved in a sensor network.

Real-time measurement ?

The time delay is negligible, compared to biological systems or analysers.

High sensitivity, at the same time low false alarm probability ?

Sensitivity is down to the ppb region with a 100 mm pathlength probe for many substances, and with this, much more sensitive than conventional DOC analysers. Also, selectivity will always be considerably higher than of DOC analysers. Therefore, false alarm probability will in principle be always much lower than i.e. turbidity, UV254, or DOC alarms.

Clear interpretability of signal and alarms ?

.... can be reached by a) by real-time reference point (“Delta-Spectrometry”) or b) sufficient baseline training.

Broad band response to diverse contamination sources (at the cost of low selectivity) ?

A broad spectrum of contaminations - but not all - can be detected. The identification of single substances or substance groups is limited to those substances that 1) are detectable in the UV-spectrum and 2) were implemented in the detection procedure. Examples: Phenol, Benzene, Toluene, Xylene, many pesticides, some nerve gases, part of the hydrocarbons / petroleum, crude oils, naphthalene, and many others. Not possible: i.e. short-chained aliphatics. For other substances, it can only be stated THAT a substance, but not WHICH one has been detected.

Reliability ?

s::can instruments were designed and built for highest operational safety and reliability, can withstand the most aggressive environment, and are most tolerant against neglect. There are no serviceable parts, and the sealed instrument can not be opened. s::can instruments can run for years without ever leaving the water.

Reproducibility ?

Because of the efficient 2-beam-design, the long term spectral signal reproducibility is higher than of any other known instrument on the market.

Robustness and long term stability of sensors and stations under harsh conditions ?

There is no service interval. The recommended maintenance interval in drinking water applications is 6 months and can be extended; the instruments are tolerant against high temperature and pressure gradients; the sensors can be installed in creeks at high water level fluctuations, in ground water wells, in pipe lines, in by-passes, etc.

Remote accessibility ?

The instruments can be remotely accessed via their remote terminals if necessary, and automated data transfer to a central station / data bank / can easily be achieved.

Low costs, allowing multi-point systems to cover larger areas distributions networks ?

The purchase and installation cost of one instrument is a fraction of i.e. a DOC analyzer; the running costs are almost zero.

High security access, secure data exchange, high security reserves on all levels ?

Depending on the application, highest security levels can be reached on a hardware and software level.