



Environmental Analytics and Solutions

DEFINE ► MEASURE ► APPLY

Powered by

LAB SYSTEMS AND BIOTECH INDIA PVT. LTD.

environmentalanalyticsandsolutions.in

**INSTRUMENTATION FOR WATER
COMPLIANCE AND PROCESS CONTROL**

**INDUSTRIAL INFLUENT / EFFLUENT
SEWER INFLUENT / EFFLUENT
DRINKING WATER INLET / OUTLET**

**MR. REEPAL JOSHI
DIRECTOR MARKETING**

Contributing to



ORGANIZATION INFORMATION

LAB SYSTEMS AND BIOTECH INDIA PVT. LTD. is more than 24 years rich in experience Organization in the field of Measurement Analytics. With couple of Business Units as Business Verticals, the Organization has always delivered Quality and Sustainable Solutions to their Customer Partners.

ENVIRONMENTAL ANALYTICS AND SOLUTIONS is one of the business units that is Powered by the rich technical expertise in the field of measurement analytics catering to WATER and AIR. With the Philosophy of DEFINE, MEASURE AND APPLY the company caters to solutions for precise measurement of polluting analytes and matrices in real time. The Organization also offers Quality Solutions that supports Water Treatment, Re Cycling and Re Use.

Our Products and Solutions for Process Control and Compliance:

1. Instrumentation for measurement of parameters like Level, Flow, Temperature, Pressure etc.
2. Reagent less Laboratory COD, BOD, TOC, TSS, NO₃, NO₂ Analyzers for Drinking and Potable Water, River Water, ETP and STP Water (Full Spectrum High Resolution UV-VIS Spectrometer).
3. Reagent less Online COD, BOD, TOC, TSS, Nitrate, NO₃, NO₂ Analyzers for Drinking and Potable Water, River Water, ETP and STP Water (Full Spectrum High Resolution UV-VIS Spectrometer)
4. Digital Sensors for Online Measurement of Parameters like pH, TDS /Conductivity, DO, Turbidity, TSS, NH₃, Chlorine, etc.
5. Online Analyzer Solutions for Measurement of Colorimetric analytes like Chromate, Silica, Hardness, Chlorides, Color, Cyanide, Phosphate etc.
6. Online Analyzer Solutions for Measurement of Specialized Parameters in Water like Algae Species, Toxicity and Total Bacterial Count.
7. Treatment Solutions like Fine Bubble Disc Diffusers, Tube Diffusers, Plate Diffusers and Ultra Filtration based MBR Membranes, Vertical Cloth Disc Filter, Electro Coagulation Units and Complete ZLD Solutions.
8. USEPA Validated Medium Pressure UV Disinfection System that offer 6 Log deactivation of Microbes and 4 Log reduction of Adeno Virus as Tertiary Treatment for Process Water.
9. Solutions for Online Measurement of Parameters for Ambient Air and STACKS etc.

Directors and Team of Helm

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MISSION

Through continuous update and innovation and introduction of new technologies and solutions for a more cleaner future,. We aim to meet the highest standards of accuracy, precision and sensitivity, from frontier market research. Our high end quality solutions and services cover the complete spectrum with long Term value for money that Complies all stringent regulatory compliance and also ready to comply the future changes.

We are committed to provide the highest level of customer satisfaction and continually contribute in improving the quality of our products and services. We therefore welcome any customer suggestions, which we would evaluate and subsequently implement for the benefits to assist you in our drive forward to enhance our future performance.

In all our interactions, we help you to identify such initiatives that would make your company a cutting edge and competitive organization implementing more professional and ethical business practices.

Lab Systems & Biotech India Pvt. Ltd has been following simple philosophies since more than 2 decades. To continuously keep Introducing innovation and new state of art technologies and solutions that will help in building more cleaner and vibrant tomorrow

To make Environmental Analytics and Solution, the product of choice for all its users and customers in the field of Environment. To provide the highest quality product deliverable and to narrow down on solution specifications, for the analytical users.

To utilize the most advanced technologies for promotion of our high end solutions. To be focused on meeting the needs of our customers on regular basis. Integrity in dealings, Innovativeness in approach, Excellence in results



VISION

“To be a recognized Brand Image not only as Solution Providers but also as support partners to make Lab Systems and Biotech India Pvt. Ltd the product of choice for all its users and customers”

Let us all together take Lead to protect our today and to make a better and cleaner Environment for tomorrow.

OLINE MEASUREMENT SYSTEMS FOR WATER SOLUTIONS COMPLIANCE AND PROCESS CONTROL ETP/STP/DRINKING

TECHNOLOGY PARTNERS



Parameters and Instrumentation

DIGITAL SMART PROBE SENSORS

■ "DIGISENS" SENSORS

**ONLINE pH/OPR, COND/TDS, DO,
TURBIDITY, SALINITY, SLUDGE LEVEL,**

Parameters and Instrumentation

DIGITAL SMART PROBE SENSORS

■ "DIGISENS" SENSORS



- pH/ORP, Cond/TDS, Turbidity, DO, Sludge Blanket, salinity, UV254 SAC (Spectral Absorption Coefficient), Multi channel Data Logger for Multi Parameters
- Probes based on over 50 years of PONSEL experience
- Applications for wastewater, sewerage networks, natural water, drinking water, etc.
- All calibration data (factory coefficients, offset, and slope) are recorded in the probe,
- Digital technology for extremely reliable data results
- Digital communication technology for Probe Sensors that offers direct 485 Modbus communication from Probe Sensors to any device. (straight to PLC/DCS and at times excluding the need of added local controller or display)**
- Available for both routine and applications demanding corrosion resistance

Parameters and Instrumentation

DIGITAL SMART PROBE SENSORS

■ "DIGISENS" TRANSMITTER – S 200



- The new S200 digital transmitter connects four PONSEL brand digital sensors to monitor the following parameters: pH, Redox, Temperature, dissolved Oxygen (by optical channel), conductivity, salinity, Turbidity (NTU), suspended material (g/L), Sludge Blanket (%), etc.
- The measured values are displayed and transferred by analog or digital means. The preconfigured regulatory functions also optimize process control.
- The S200 unit is related to a wide range of perturbation-resistant digital sensors: pre-amplification built into the sensor and digital processing of signals. All data regarding calibration, logs, users and measurements are processed directly in the sensor allowing for extremely reliable and traceable measurements.

Techno Commercially Feasible Intellectual S 200 Controller design that offers

- Four digital sensor inputs
- Two 4-20 mA outputs, 2 relay outputs
- Modbus RTU output

Parameters and Instrumentation

DIGITAL SMART PROBE SENSORS

■ DIGISENS SENSORS - BREIF

ONLINE $\text{NH}_4 - \text{N}$ AMMONIUM NITROGEN

Parameters and Instrumentation

DIGITAL SMART PROBE SENSORS

■ "DIGISENS" SENSORS - Ammonium HYDRA®-DS - BREIF



- The Ammonium HYDRA®-DS Analyzer measures the concentration of dissolved ammonium as nitrogen (NH_4^+-N) in water.
- The sensor uses three electrodes to determine the NH_4^+-N concentration, an Ammonium Ion Electrode, a Potassium Ion Electrode and a pH Electrode. It is designed for use in all kinds of water.
- Typical applications include monitoring environmental waters, lakes, streams and wells as well as wastewater treatment in aeration basins and effluent.

Parameters and Instrumentation

DIGITAL SMART PROBE SENSORS

■ "DIGISENS" SENSORS - Ammonium HYDRA®-DS - BREIF

The Ammonium Ion Electrode provides the primary measurement. Any potassium ion in the sample generates a positive interference in the measurement, due to its similar size and charge to the ammonium ion. A Potassium Ion Electrode measures the amount of potassium ion present in the sample and T80 Transmitter subtracts the appropriate amount of signal from the Ammonium Measurement. The Ammonium Ion Electrode only measures the ammonium ion (NH_4^+) not ammonia (NH_3). Ammonium ion and ammonia coexist in a pH dependent ratio in solution. The more acidic pH values favor the NH_4^+ and the more basic values favor dissolved ammonia gas, NH_3 . The pH Electrode measures the pH and the T80 Universal Transmitter calculates the total $\text{NH}_4^+ \text{-N}$ concentration based on the pH vs. NH_4^+ concentration profile stored in the instrument. Temperature is measured and used to compensate each of the three electrode measurements. While the pH Electrode's response is well defined with respect to temperature, the ion electrodes, NH_4^+ and K^+ , tend to be less well behaved. For the best results, calibrate the sensors near the process temperature.

Parameters and Instrumentation

DIGITAL SMART PROBE SENSORS

■ "DIGISENS" SENSORS - Ammonium HYDRA®-DS – BREIF

The Ammonium HYDRA®-DS Analyzer is configured to periodically actuate a cleaning cycle using the integral spray cleaner in the sensor. This minimizes the formation of biofilms or other coatings on the electrodes which keeps maintenance to a minimum. The period and duration of the cleaning cycles are user configurable. During the cleaning cycle the 4-20 mA output is held at either the last value or a preset value. The rugged HYDRA®-DS Sensor has 1 ¼" NPT rear facing threads for attaching an extension/immersion tube for easy installation from catwalks or handrails. The HYDRA sensor is submersible with an IP68 degree of ingress protection. The HYDRA sensor can not be supported by the cable and the cable must not be immersed in the water. A removable electrode guard facilitates easy electrode replacement when necessary. The HYDRA-DS is a digital sensor that allows any size length of cable.

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

- Complete Spectrum UV-Vis analyzer for measurement of parameters like COD, BOD, TOC, TSS, NO₃, NO₂ etc
- Online Colorimetric analyzer for parameters like Aluminium, Ammonia, Chloride, Chromium VI, Copper, Cyanide, Formaldehyde, Hardness, Hydrazine, Iron, Manganese, Mono-chloramine, Nickel, Nitrite, Phenol, Phosphate, Silica, Sulfate, TP, Zinc, etc..others..
- Online Analyzers for Ozone and Free, Residual and Reactive Chlorine with pH compensation



Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

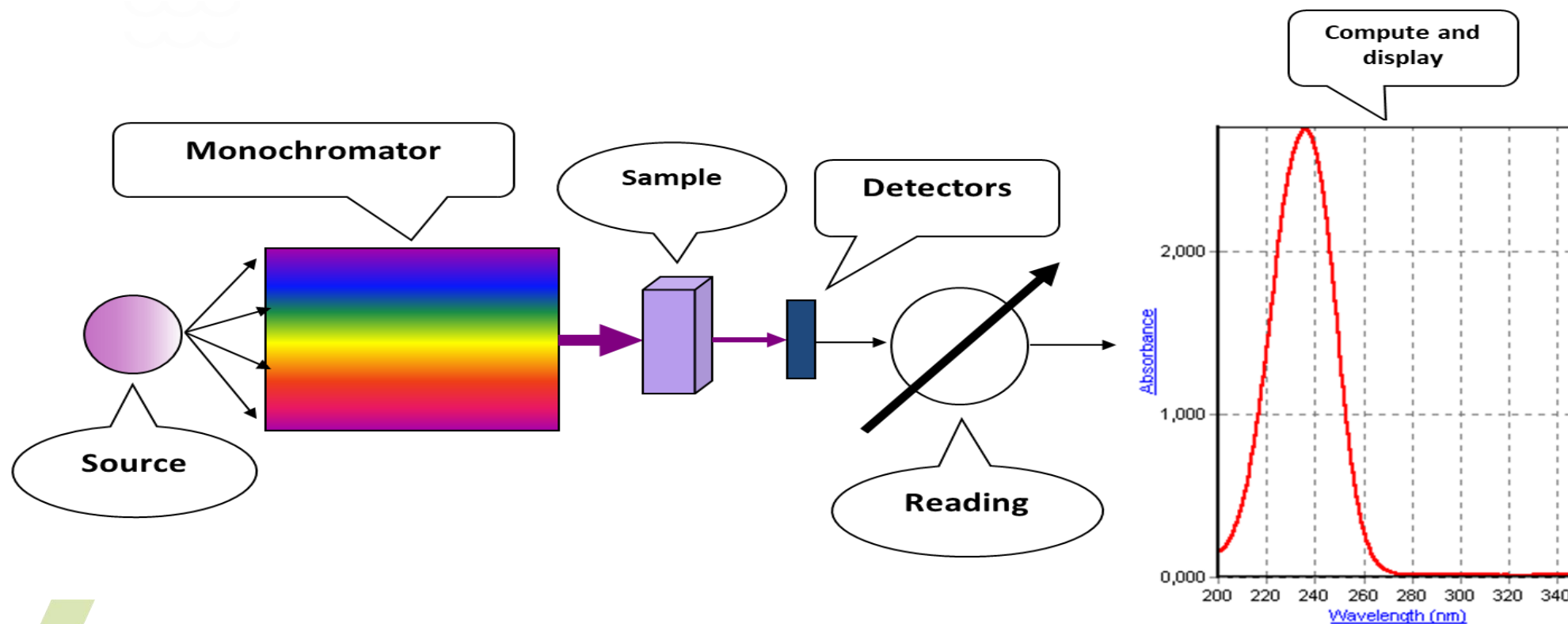
■ **STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER**

ONLINE COD, BOD, TSS, NO₃, NO₂

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

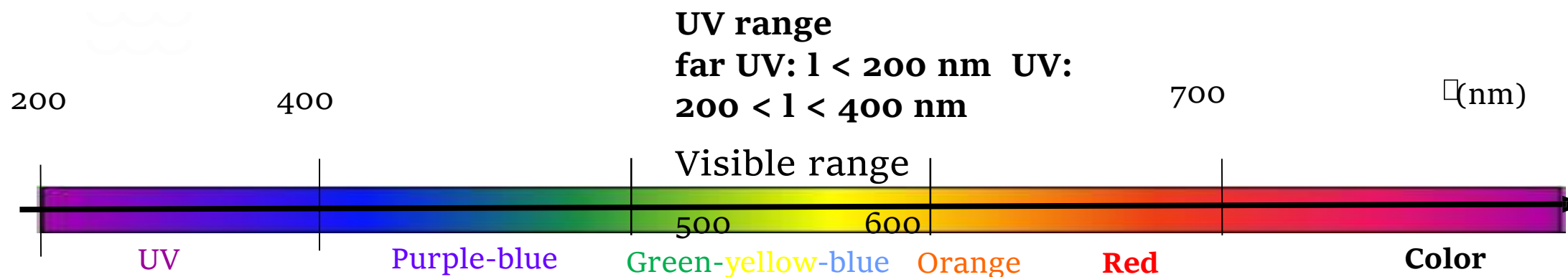
■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER – THEORY BREIF



Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER – THEORY BREIF



STAC2 analyzers read the sample absorbance in the range of 200 to 350 nm (or 900 nm). Those readings are displayed as a graph (Absorbance vs Wavelength) called **Spectrum**.

The absorbance of a sample is the quantity of light absorbed by a transparent device at a specific wavelength. If the light transmitted by a pure water sample is T_0 and the light transmitted by a polluted water sample is T_1 , then: Absorbance of polluted sample is the logarithm of T_1/ T_0 ($Abs = \log (T_1/T_0)$)

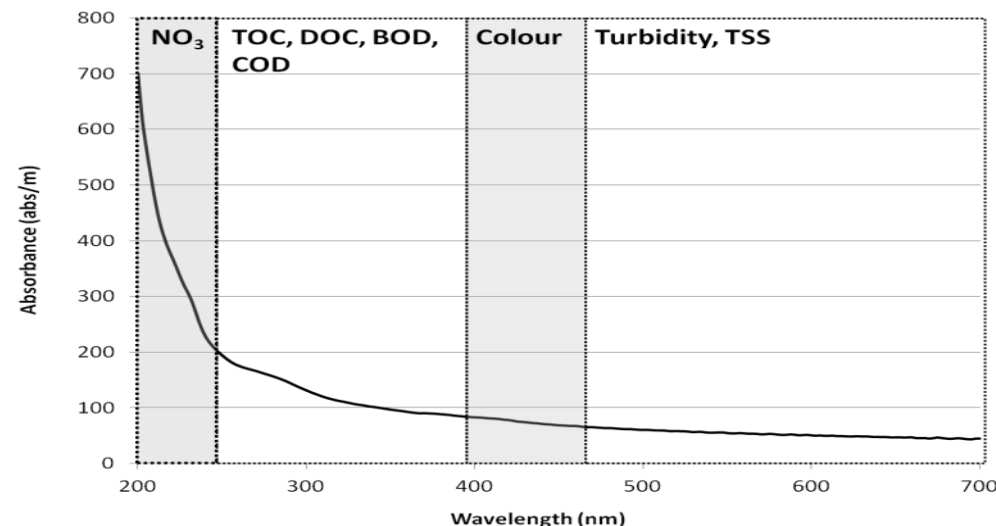
Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER – THEORY BREIF

Global Parameters

- Most of the organic compounds are UV absorbing, so the SECOMAM principle can be applied to the global parameters.
- SECOMAM analysers are using a unique mathematical algorithm to match UV spectrum and global parameters with an unsurpassed correlation quality.
- COD, BOD TOC and TSS can be read simultaneously by the SECOMAM deconvolution systems



Typical UV/Vis absorption spectrum of municipal wastewater. Areas used for determination of common UV/Vis parameters are indicated

Parameters and Instrumentation

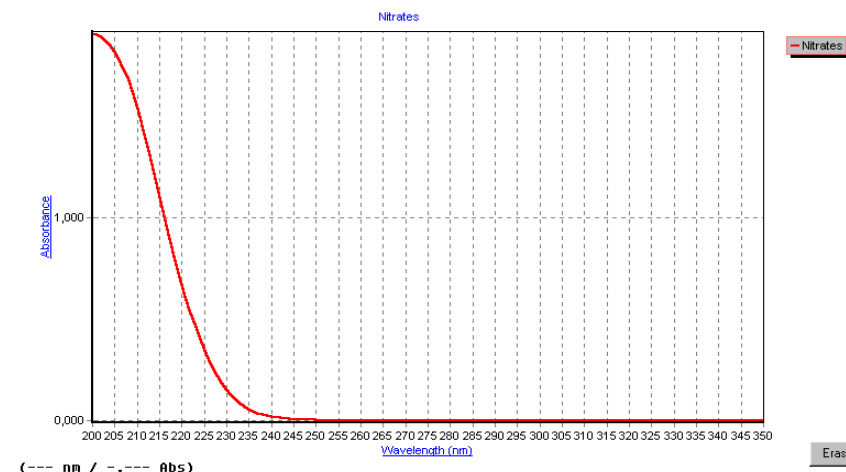
"INTELLACT" ONLINE ANALYZERS

■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER – THEORY BRIEF

Specific compounds

AQUALABO analyzers read some specific compounds absorbing UV lights (Nitrates, Anionic detergents, Humic substances, Phenol, Chrome VI) and some synthesized organic compounds.

The sensitivity of the instrument depends on length of its measurement compartment; a longer path length gives higher sensitivity but also a reduced maximum concentration level at which the instrument can operate.



Example: Nitrate UV spectrum STAC2

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER – THEORY BREIF

Main characteristics of some Organics and minerals molecules

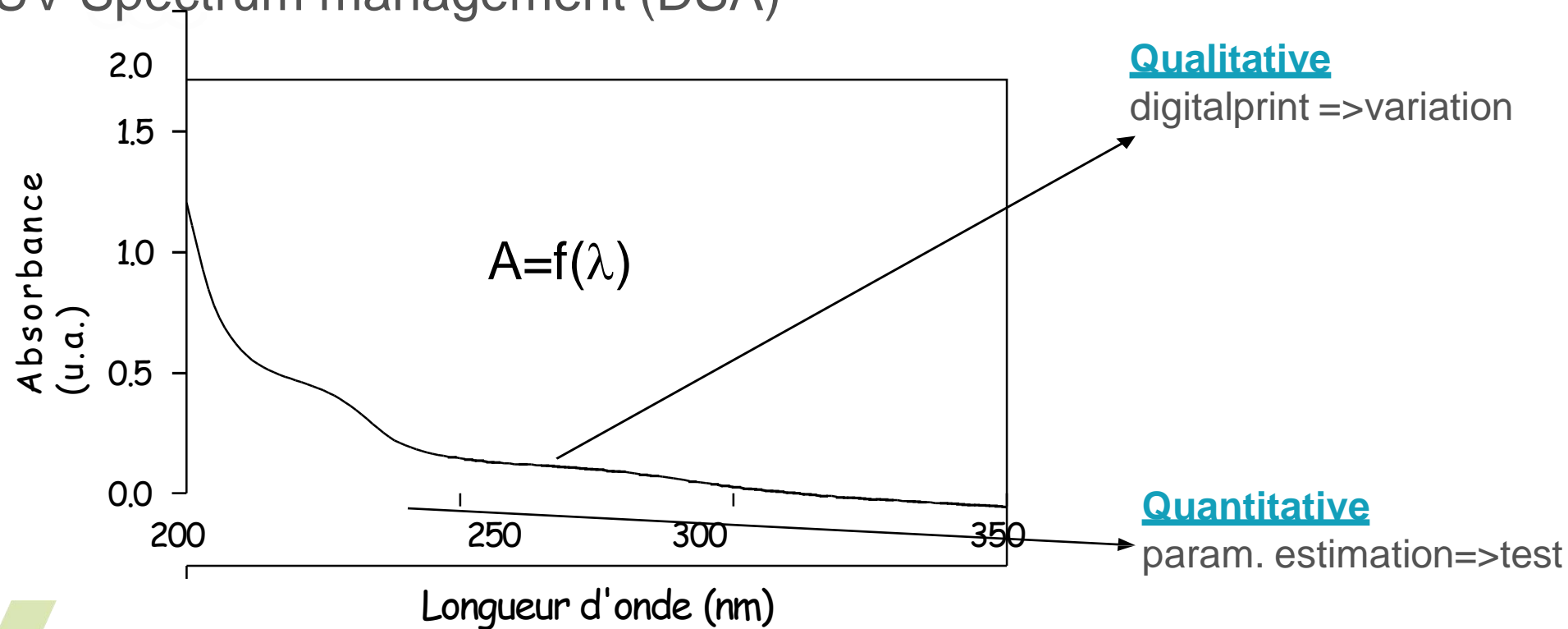
Compounds	λ max (nm)
Acide formique	204
Acide maleique	210
Acide oxalique	200
Acide glyoxilique	208
Phenol	216
Potassium hydrogenophtalate	236
Ethylene glycol	217
Dodécylbenzène sulfonate	223
Créatinine	214
Nitrite	210
Nitrate	207
Chromate	260
Hypochlorite	292

Parameters and Instrumentation

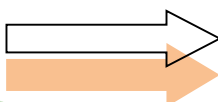
"INTELLACT" ONLINE ANALYZERS

■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER – THEORY BREIF

UV Spectrum management (DSA)



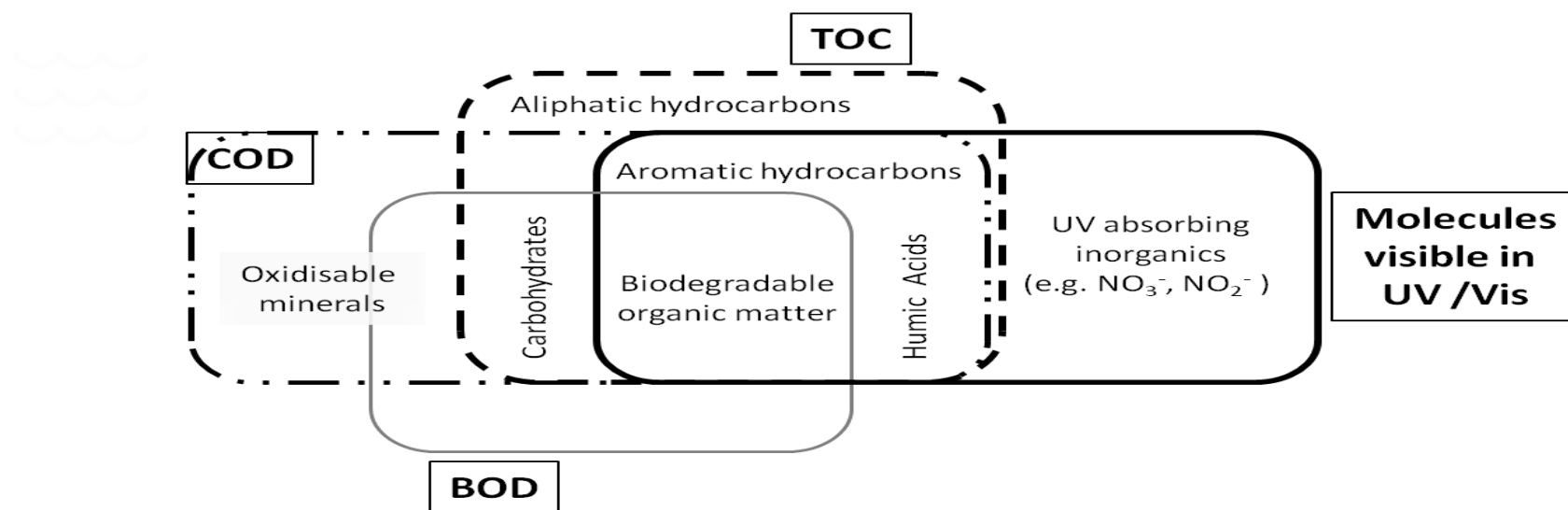
Chemical and physical responses



Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER - THEORY BREIF



The relationship between UV response and sum organic parameters.

Van den Broeke et al, in Press

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER – THEORY BREIF

On-line analyzer for measuring in UV the content of organic matter (COD, BOD, TOC), suspensions (SS) and nitrates (NO₃), nitrites (NO₂)

Collecting of a sample and UV scan of sample **(Measuring Changing Waste Water Matrix)**

UV scan is compared to internal reference base (UV Model). As standard 4 models : Natural water, Influent domestic WWTP, Effluent Biological WWTP, Effluent Physico WWTP.

If no match is found, analysis is halted.

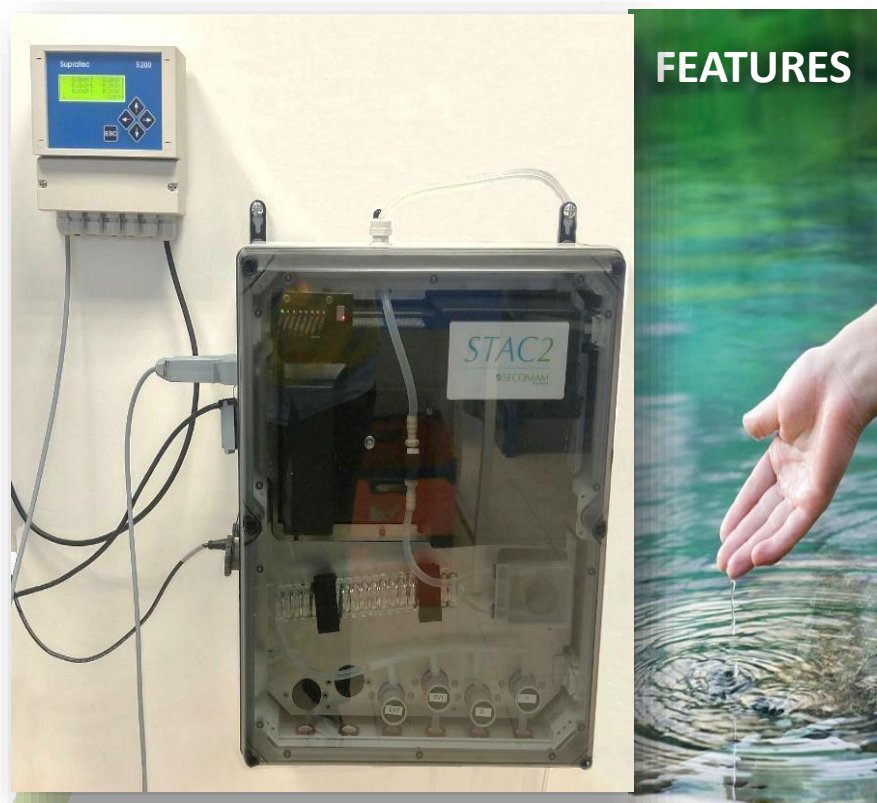
If match is found, internal software uses information from scan (UV peak locations and amplitude) along with associated data from reference base to complete the analysis

Results displayed to user.

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ STAC 2 FULL SPECTRUM SCANNING UV-VIS ANALYZER - FEATURES



Automatic sampling, Automatic dilution, Automatic cleaning
Complete Compliance as CPCB GUIDELINES for measurement of Water Quality Parameter for Changing Water Matrix

Simultaneous Measurement of several parameters :

COD, BOD, TOC, SS, NO₃, NO₂

1 to 4 channels -> 1 to 4 different sample Streams

Field replaceable path lengths 2 mm, 5 mm and 50 mm

Separate Algorithms for ETP, STP and Pure Water

Quantitative & Quality information

1x Ethernet RJ45 port for MODBUS and/or HMI access

1x WIFI connection for HMI access

1x USB port for USB Key recorded data history backup

S200 EXTERNAL DISPLAY

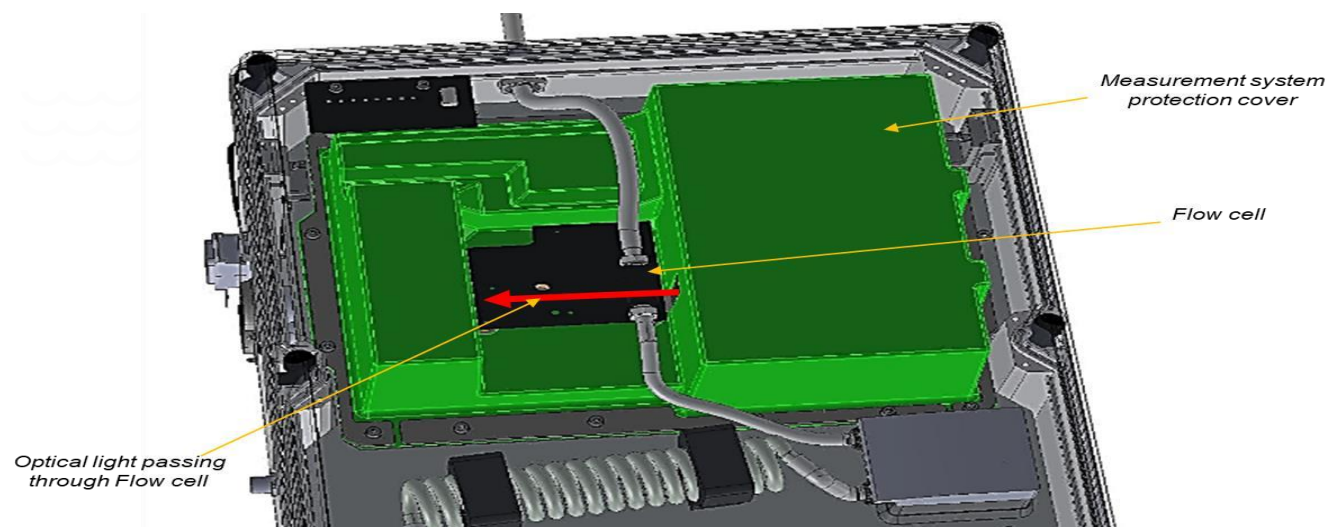
Connection via Modbus STAC2 output/Modbus S200 input

Display of mg/L concentrations and restitution in relation to UV models.

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER – HARWARE WARRANTY



The optics (in green) parts includes **Hardware Warranty for 3 years by factory**

Optical system including **XENON lamp with more than 10 years expected life** and dedicated electronics & optics.

Flow cell (2 mm, 5 mm and 50 mm optical path following the concentration to measure).

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER – KEY FEATURES

- 3 years Hardware Warranty on Entire Integrated Spectrometer
- Xenon Lamp source with more than 10 years life
- No running cost for Solvents or Chemical Kits needing measurements
- **Full Spectrum Scanning Spectrometer from 190 nm to 800 nm gives complete measurements of all carbon bands in the range from 190 nm to 400 nm and offers excellent turbidity and color compensation in the range from 400 nm to 800 nm.**
- The **Best in industry 1 nm resolution** and due to use of **Quartz Coated Optics** makes measurement possible for future upgrades for Parameters like Phenol, Nitrate, Nitrite, Aromatic Hydrocarbons, Total Pesticides, Organic Detergents, Humic Acid, Oxidizable Minerals, color measurements along with COD, BOD, TOC, TSS measurements with the same system.

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER - KEY FEATURES

- Ethernet, RS 485 MODBUS, WIFI protocols offered as standard with the system for two way communication
- Separate Algorithms for ETP, STP and Drinking Water
- **Field replaceable Pathlength upgrades Possible for 2 mm, 5 mm and 50 mm depending on lowest concentration and accuracy of measurement needed**
- Built-in USB Storage device makes possibility of storage of more than 1 year data.
- PC Software tools also available
- **Same System can be upgraded for measurement of up to 4 channel for 4 different process streams**
- Optionally 4..20 mA analogue signal outputs for multi channel measurements available
- **100% Field Serviceable unlike Dip type Sensors which either needs to be discarded or needs to be sent to factory for repairs which adds to expensive costing.**
- Data transfer to Validated servers of CPCB and SPCB via digitally interfaced protocols.
 - **TUV Certified as per requirement of CPCB Guidelines**

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ STAC SENSE DUAL WAVELENGTH UV-VIS SENSOR - FEATURES



- UV 254 spectral absorption without any reagents or consumables.
- Multi-parameter measurement: SAC254, CODEq, TOCeq & BODEq, Turbidity eq
- Modbus RS-485 digital communication.
- Automatic Turbidity compensation.
- **Digital communication technology for Probe Sensors that offers direct 485 Modbus communication from Probe Sensors to any device. (straight to PLC/DCS and at times excluding the need of added local controller or display)**

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ STAC SENSE DUAL WAVELENGTH UV-VIS SENSOR - FEATURES

The Stac Sense probe uses UV absorption at 254 nm to measure organic compounds dissolved in water. This absorbance is correlated with the concentration of TOC, COD and BOD to provide a high-performance probe requiring no consumables.

A reference measurement at 530 nm is used to compensate for the presence of particles in the sample that also absorb UV light and to establish the Turbidity parameter.

The use of a state-of-the-art high-performance UV LED, combined with rigorous ignition management, offers an optimal variance of the signal.

The Spectral Absorption Coefficient (SAC) at 254 nm helps determine the Organic Content of a water sample but also the COD, TOC and BOD parameters by applying the appropriate correlation coefficients. The Stac Sense sensor connects to any type of recorder, transmitter, remote management system or PLC using a Modbus RS-485 input. As a result of sensor indexing, more than 200 sensors can be connected to a recorder.

Interference-proofing: pre-amplification built into the sensor and digital signal processing.

All calibration, history, user and measurement data are processed directly in the Stac Sense Probe and transmitted by a Modbus RS-485 or SDI-12 link.

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ CL₂ COLORIMETERS - PROGRAMMABLE ONLINE PHOTOMETERS

**ONLINE PHOSPHATE, CHROMATE, SILICA
ETC..**

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ CL₂ COLORIMETERS - PROGRAMMABLE ONLINE PHOTOMETERS - FEATURES



FEATURES



Automatic sampling, Automatic dilution, Oxidation Module
Methods configurable for various analyte measurement

1 to 2 channels -> 1 to 2 different sample Streams

Cell Diameter: 16 mm or 26 mm

Lower range - bigger cell diameter

Number of Reagent Pumps (up to four - depending on the parameter)

Wavelength - depending on the parameter

ACCESSORIES

Sequencer Multi Stream (Upto 4 Streams)

Filtration Unit with Mounting set

Fast Loop Reservoir with level switch

Dilution Water Reservoir with level switch

Parameters and Instrumentation

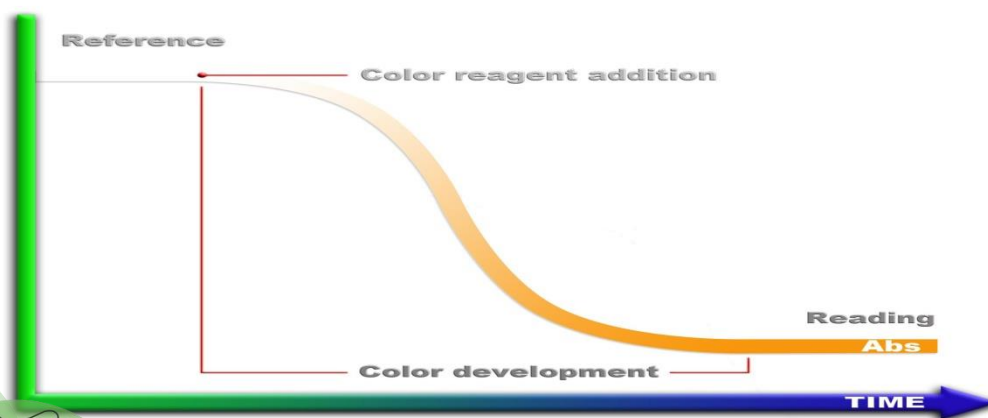
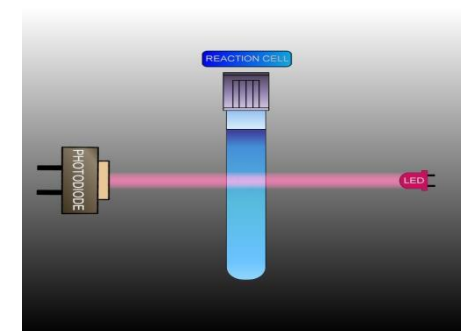
"INTELLACT" ONLINE ANALYZERS

■ CL₂ COLORIMETERS - PROGRAMMABLE ONLINE PHOTOMETERS – THEORY BREIF

Analysis method: differential photometric absorbance

3S Colorimeter makes two measurements during an analysis cycle:

The first step is the measurement of the raw sample and allow to compensate the colour and the turbidity of the sample and the fouling of the cell



The second step is the measurement of the sample after reagent addition and reaction time. The concentration is measured with the absorbance calculated with the difference between the two measurements and with the stored calibration parameters.

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ CL₂ COLORIMETERS - PROGRAMMABLE ONLINE PHOTOMETERS - KEY FEATURES

Easy configuration With our modular configuration we can automate your color laboratory method with up to four reagents.

Dual compartment enclosure To ensure complete separation between electronics and hydraulics.

Touchscreen interface Simple and user friendly menus and functions. Internal datalogger with USB data download

Separate waste line for sample containing reagents

Long autonomy, low maintenance, low operating cost

Rugged and reliable

Designed for industrial and environmental on-line applications, ensures the highest level of robustness in the electronics, mechanics and hydraulics components.

Easy installation and operation

To start measurement is enough to power the analyzer and connect reagents, sample and waste line.

Low reagent level alarm

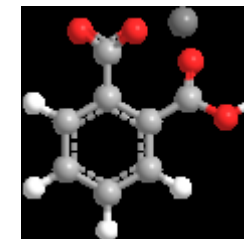
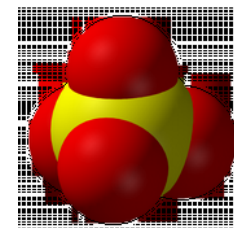
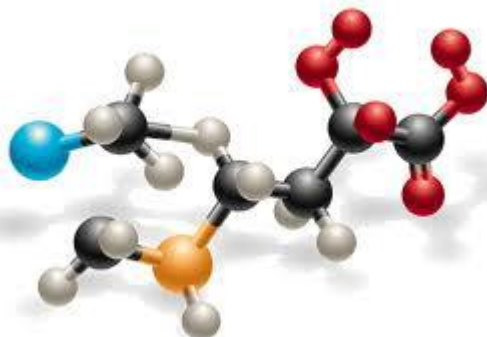
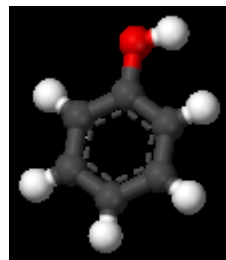
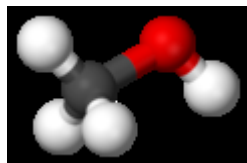
Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ CL₂ COLORIMETERS - ANALYTE MEASUREMENTS - ANY COLOR LABORATORY METHOD WITH UP TO FOUR REAGENTS

PARAMETERS

ALUMINIUM (Eriochrome & Pyrocatechol), AMMONIA (Indophenol & Salicylate), BROMATE (Azomethine H), CHLORINE / TOTAL CHLORINE (DPD), CHLORIDE (Mercuric Thiocyanate), CHROMIUM VI (Diphenylcarbazide), COPPER (Bathocuproine), CYANIDE (Chloramine-T), HARDNESS (O-cresolphthalein complexone), HYDRAZINE (p-dimethylaminobenzaldehyde), IRON / TOTAL IRON (TPTZ & Ferrozine & Phenantroline), MANGANESE (Formaloxime), MONOCHLORAMINE (DPD), NICKEL (Dimethylglyoxime), NITRITE (Diazotisation), PHENOL (4-aminoantipyrine), PHOSPHATE (Blue molybdate & yellow vanadomolybdate), SILICA (Blue molybdate), SULPHATE (Turbidimetric barium chloride), TP (Oxydation + blue or yellow), ZINC (Zincon)



Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER - BREIF

**ONLINE OZONE, RESIDUAL CHLORINE,
FREE CHLORINE, REACTIVE CHLORINE**

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ OZONE /CHLORINE WITH pH - ONLINE OZONE AND CHLORINE MONITORING SYSTEM - BREIF



FEATURES

The principle of measure is based on potentiostatic sensor, without reagent or consumable, on a closed-loop so reducing the costs of functioning and avoiding the loss of online water. The whole WCS for Ozone/ Chlorine includes all necessary for the measure of concentration : electrode potentiostatic indestructible for the measure of Ozone, chlorine electrode pH, and compensation in flow, room of opaque measure, closed loop. Function of automatic auto-cleaning by electrolysis allowing to dissolve the firm deposits: limestone or fats.

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ OZONE /CHLORINE WITH pH COMPENSATION - ONLINE OZONE AND CHLORINE MONITORING SYSTEM - KEY FEATURES

Self cleaning of the system

Accurate measurement of Ozone / Chlorine concentration with pH measurements

Measuring principle Free Chlorine/Ozone **Potentiostatic with one gold ring with excess of 4 years life**

Measuring principle pH, Reference used on the pH probe Combined electrode reference / measure

Temperature : -30.00 to +140.00 °C

Complete system plug and play.

Access to the menus of programming secured via password (3 user's levels).

Controller possessing numerous possibilities of piloting: 2 digital output for the control of the frequency of functioning of dosing pump, 3 relay output potential free NO contacts., 2 analog output 0/4-20 mA, 2 separately adjustable PI..controllers.

Temperature compensation manually or by using a Pt100 or Pt1000

Calibration of the pH with automatic detection of the value of the buffer solution

Calibration of Ozone / Chlorine with DPD method in single point

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ BACT CONTROL – ONLINE BACTERIA MONITORING

ONLINE BACTERIA MONITORING

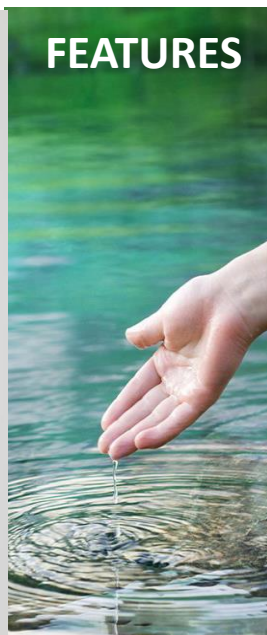
Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ BACT CONTROL - ONLINE BACTERIA MONITORING SYSTEM - FEATURES



FEATURES



US patent No.8,518,246 -US 2010/0193313

Based on Patented Fluorescent measurement

Automatic sampling

Methods configurable for four different types of Bacterial measurement

β -Glucuronidase-> indicates *E.coli* activity

β -Galactosidase-> indicates Coliform activity

Alkaline Phosphatase -> indicates Total Activity

β -Glucosidase -> indicates Enterococci

1 to 2 different sample Streams

Online Real Time measurement every 90 mins compared to 3 days to 5 days by conventional methods

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ BACT CONTROL - ONLINE BACTERIA MONITORING SYSTEM - BRIEF

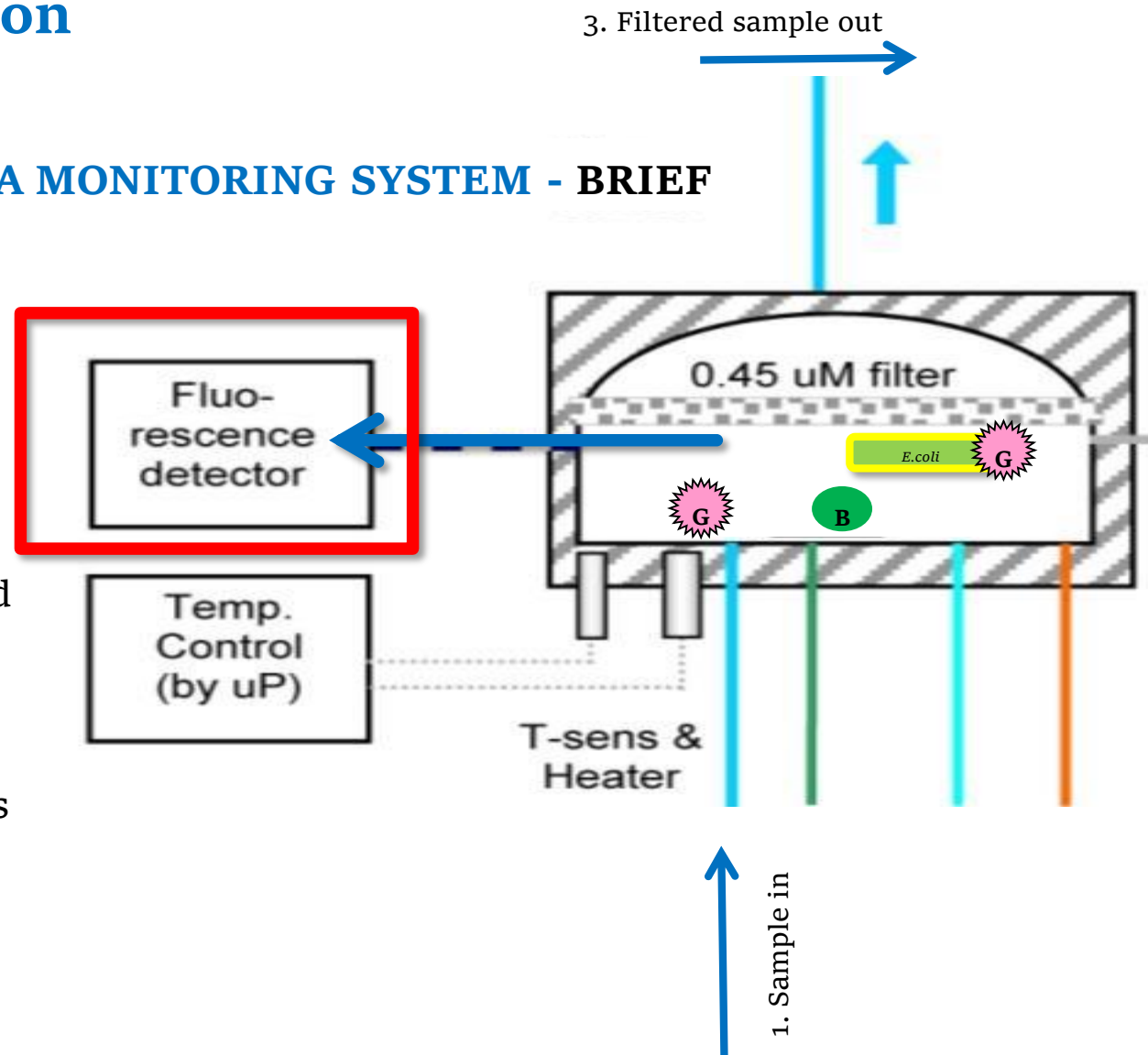
- The BACTcontrol is an “early warning system”, complementing the officially accepted methods for the detection of microbiological activity. The measurements are realized in a short period of time, 1-2 hours, depending on the sampling volume and cleaning procedures. This is in contrast to classical microbiological methods, which are labor-intensive and in which cultivation of the organisms is required, taking several days before obtaining reliable results (24-48 hours).
- The BACTcontrol is an online automated instrument for the detection of microbiological activity in water. It measures the specific enzymatic activities of β -galactosidase (coliforms), β -glucuronidase (E.coli) and alkaline phosphatase (total activity, biomass), as an indicator of the presence of bacterial contamination. The enzyme activity is detected by adding reagents (consumables) which contain a fluorescent indicator. The reagents are substrate-specific for the enzyme to be detected, meaning that there is an increase in fluorescence when the enzyme is present in the sample.

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ BACT CONTROL - ONLINE BACTERIA MONITORING SYSTEM - BRIEF

- Sample going into the reaction chamber
- Sample is filtered and E.coli stays in the reaction chamber
- Filtered sample goes to waste
- Buffer is added
- EC solution (β -Glucuronidase) is added and reacts with the enzyme in the bacteria
- A fluorescent compound (methylumbelliferone) is released which is measured by the FluMini (detector)



Excitation is at 366nm

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ BACT CONTROL - ONLINE BACTERIA MONITORING SYSTEM - KEY FEATURES

- Integrated PC with Windows
- Graphical user interface with touchscreen
- Full network capability via direct LAN
- 2 x USB 2.0 type A
- 2 x LAN 10/100/1000MB/s; RJ-45
- 2x digital input
- 2x relays output
- Protocols: Modbus TCP and Modbus serial, others on request
- 1 x 4 - 20mA outputs
- English operating system: German, French and Spanish, and others on request
- Modem slot for UMTS, ISDN or analog (modem optional)
- Second sample inlet / extra rinsing
- Air-conditioning unit (if higher than 30°C / 86F)

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ BACT CONTROL - ONLINE BACTERIA MONITORING SYSTEM - KEY FEATURES

- **Automatic cleaning**

- User selectable cleaning cycles
- Cleaning solution (sodium hypochlorite solution < 0,05% active) prevents fouling and enables unattended deployment for several weeks.
- Protection classification: IP 54
- Power consumption (average): <100W
- 1 programmable pump (sample).



Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ **TOX CONTROL – ONLINE CHEMICAL TOXICITY ANALYZER**

ONLINE CHEMICAL TOXICITY MONITORING

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ TOX CONTROL - ONLINE CHEMICAL TOXICITY MONITORING SYSTEM - FEATURES



The TOXcontrol measures by reacting to a broad range of toxic contaminants in water

Have been tested on > 5,000 chemical substances (Kaiser et al).

The test is sensitive to different substance groups within a relatively short time frame (5 to 15 minutes)

Robust, reproducible and verifiable

Validated by US-EPA

Conform ISO Norm 11348 part 1 using freshly prepared bacteria

Both positive and negative control samples

Blank for negative control

ZnSO₄ (10 mg/L) as positive control

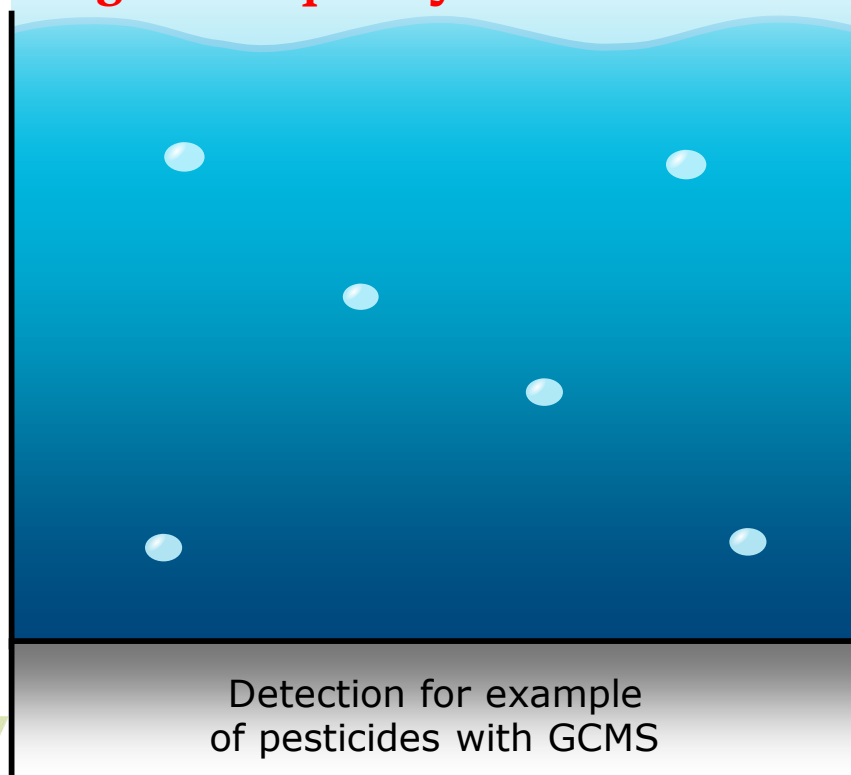
Online Real Time measurement every 15 mins compared for any chemical complex contributing to toxicity in water

Parameters and Instrumentation

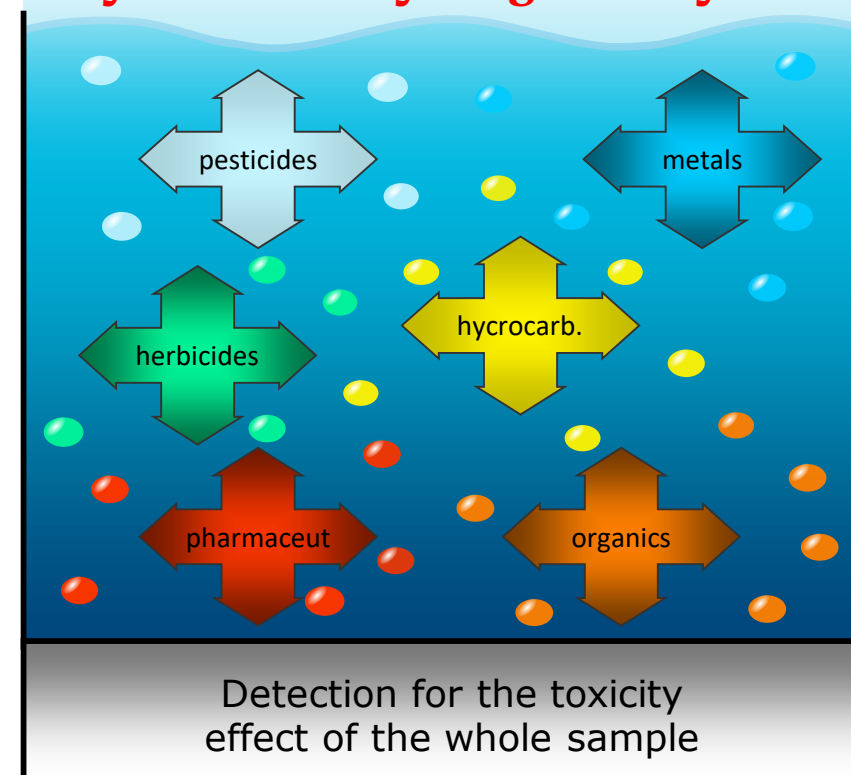
"INTELLACT" ONLINE ANALYZERS

■ TOX CONTROL - ONLINE TOXICITY MONITORING SYSTEM - BRIEF

Screening water quality for chemical toxicity induced for any chemical by single analysis method



Measures
% Toxicity



Response in a GCMS is limited to the number of compounds that are known in the database and allow this type of analysis (e.g. compounds which are sufficiently volatile), and depending on the columns, eluates etc, etc.

Parameters and Instrumentation


"INTELLACT" ONLINE ANALYZERS

■ TOX CONTROL - ONLINE TOXICITY MONITORING SYSTEM - BRIEF


Screening water quality for chemical toxicity induced for any chemical by single analysis method

It still is possible to analyse for traces for major of bio and chemical substances, which are brought into by nature or by man kind with the most advanced instruments it's only possible to detect them and take appropriate solutions

✓ Biomonitoring will show the possible dangerous effects of the total water sample !



Disinfection and Detection
by other instruments



Disinfection and Detection
by
Biomonitoring

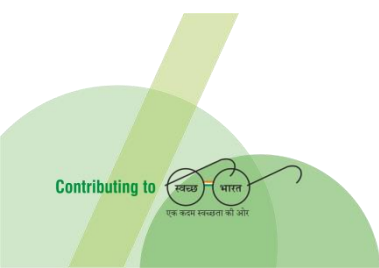
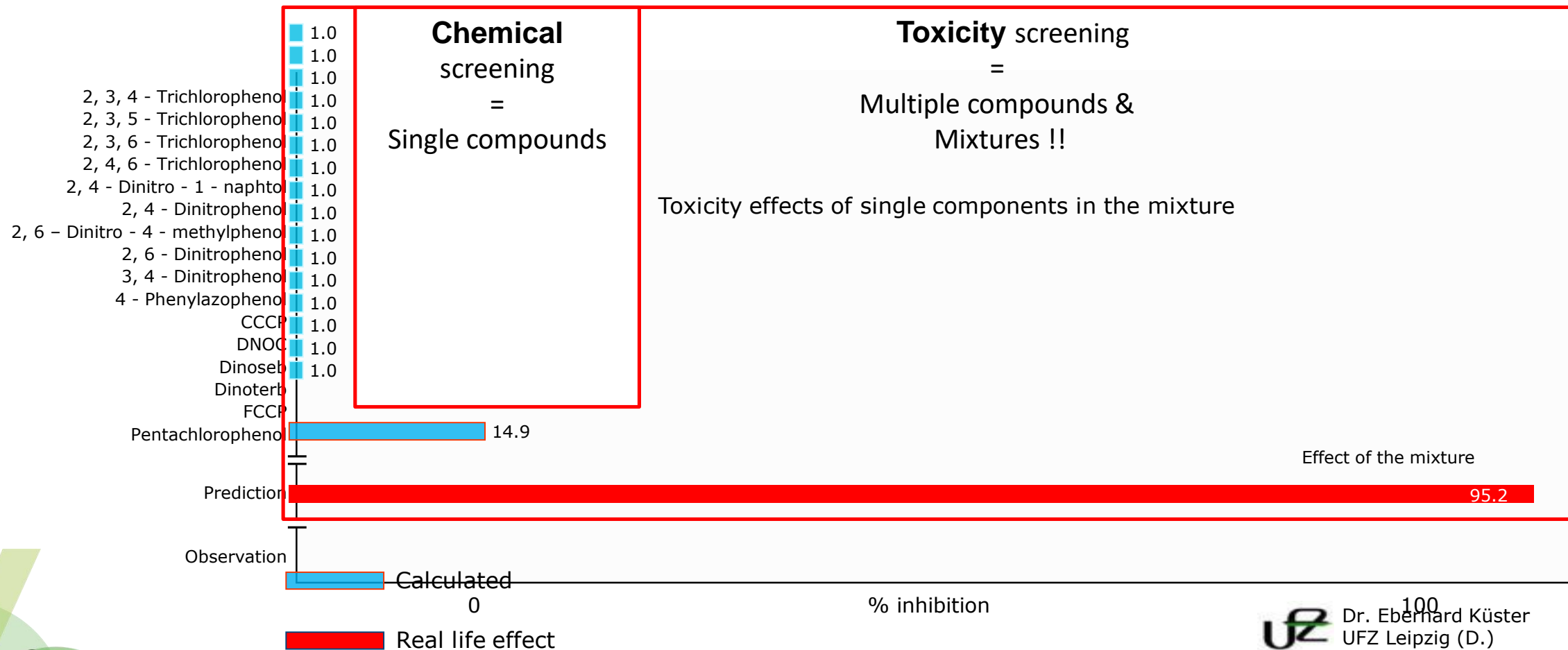


Detection of a total
Water sample
small portion!

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ TOX CONTROL - ONLINE TOXICITY MONITORING SYSTEM - BRIEF



Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ TOX CONTROL - ONLINE CHEMICAL TOXICITY MONITORING SYSTEM - KEY FEATURES

Sample temperature: 15 - 30 degrees C.

- Communication:

- a. standard: TCP/IP, Analog output: 4 - 20 mA
- b. optional: external USB modem 56k
- c. optional: External COM port for MODBUS data communication.

- Cabinet: protection class IP 31.

- In-line, automatic dechlorination is possible - Connections:

- a. Drain : waste and positive control: 20 mm (external)
- b. Feed : sample and reference: 4 mm (external, for silicone tubing)

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ TOX CONTROL - ONLINE CHEMICAL TOXICITY MONITORING SYSTEM - KEY FEATURES

- Smaller footprint: 50x50x 183 cm (D x W x H).
- Communication : integrated 4-20 mA signal, TCP/IP
- Optional: modem for telephone connection or additional RS232 connection.
- Very reliable, low running & maintenance cost.
- TOXview software for data acquisition & evaluation.
- Can be used with automatic, in-line dechlorination.
- Optional UV-Vis sensor (STAC Series) for TOC, BOD, turbidity, SAC254, NO₃-N.

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ TOX CONTROL - ONLINE TOXICITY MONITORING SYSTEM - VALIDATION

TOX CONTROL USEPA VALIDATION 2005, CINCINNATI, USA

- TOX Control was tested in the Sentinel US EPA project



Toxicity test results:

- 3,6 ppm toluene: 10%
- 5,6 ppm toluene: 25%
- 3,2 ppm atrazine: 10%
- 6,7 ppm atrazine: 25%
- 0,21 ppm copper: 10%
- 0,24 ppm copper: 25%
- 50 ppb cyanide 25% (30 min)
- 1,0 ppm cyanide: 10%
- 2,4 ppm cyanide: 25%
- 0,4 ppm diazinon: 10%
- 0,7 ppm diazinon: 25% (15min exposure)

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ **ALG CONTROL – ONLINE ALGAE MONITORING SYSTEM**

ONLINE ALGAE MONITORING

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ ALG CONTROL - ONLINE ALGAE MONITORING SYSTEM - BRIEF



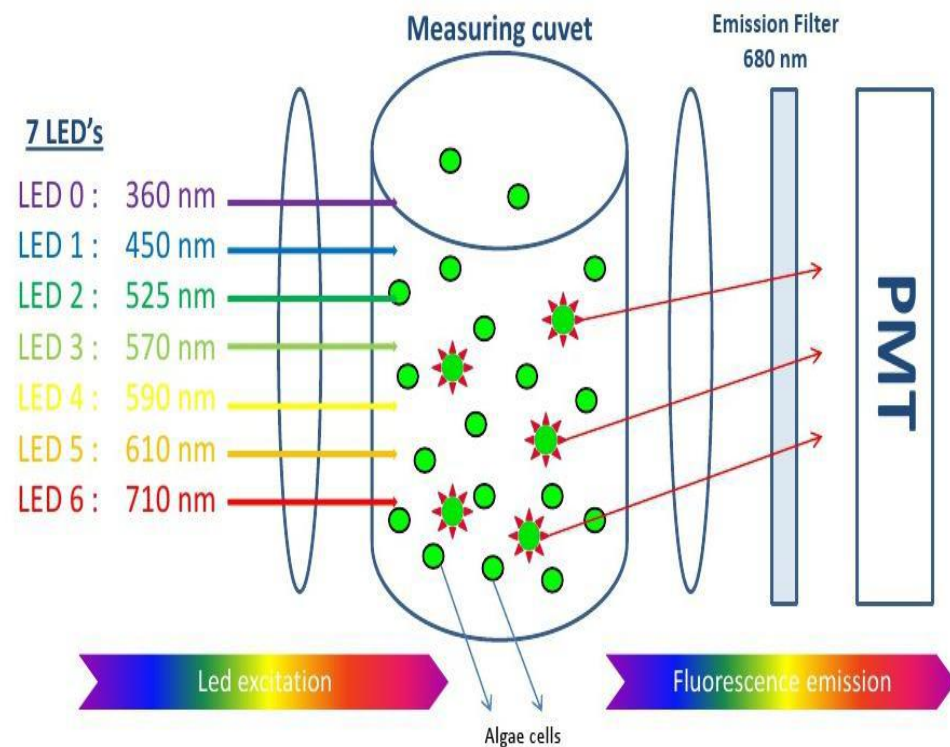
The ALGcontrol makes use of fluorescence excitation. This means that when chlorophyll molecules absorb light, a fraction of the energy absorbed is reemitted as fluorescence. Due to the fact that algae of the same division contain a similar quantity and quality of pigments, their fluorescence excitation spectrum (with a fixed emission wavelength at 680nm) is significant. Thus, it is possible to differentiate divisions of algae by their fluorescence excitation spectrum. In addition to this, other fluorescing matter (for example, DOM = dissolved organic matters measured with the 365nm wavelength and turbidity, measured with the 710nm wavelength) are detected to enhance the accuracy.

Online Real Time measurement every 10 mins

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ ALG CONTROL - ONLINE ALGAE MONITORING SYSTEM - BRIEF



The ALGcontrol uses 7 Light Emitting Diodes or LEDs for fluorescence excitation. The LEDs emit light at 7 selected wavelengths (365nm, 450nm, 525nm, 570nm, 590nm, 615nm and 710nm).

The LEDs in the ALGcontrol are switched on, one after the other, at high frequency. The fluorescence signal for each LED is measured and averaged during a pre-defined time. The fluorescence values for each of the LEDs are given in “counts” after the measurement and shown as raw data. The concentration of the algae will be calculated from these values (counts) to $\mu\text{g/l}$ and the results are displayed in a graph. Correction for other fluorescing matters (DOM and turbidity) will also be calculated automatically

Excitation is at 366nm

Parameters and Instrumentation

"INTELLACT" ONLINE ANALYZERS

■ ALG CONTROL - ONLINE ALGAE MONITORING SYSTEM - KEY FEATURES

- Integrated PC with Linux-based operating system
- Graphical user interface with interactive touch screen operation
- Full network capability via direct LAN connection
- All standard communications interfaces are supported CAN-Bus, LAN, Modem and RS232 or RS485
- Protocols: Modbus TCP and Modbus serial, other on request
- Profibus with converter
- 2x output 4 - 20mA

Parameters and Instrumentation

"DIGISENS" SMART PROBES AND "INTELLACT" ONLINE ANALYZERS - APPLICATIONS



▶ STANDARD APPLICATION

After answering to our project study questionnaire, we want to know if your application is corresponding to an existing standard model for parameters COD, BOD, NO₃ and SS.

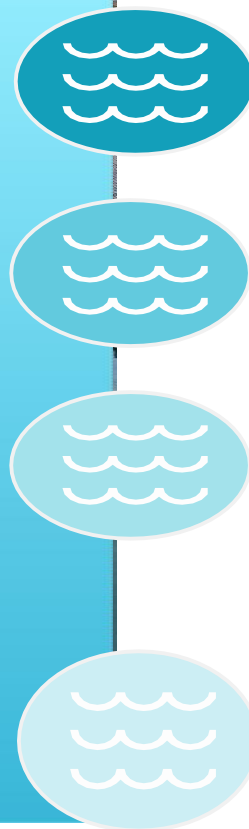
- Natural water (rivers, lakes, wells, springs...)
- Urban effluents – WWTP inlet (<40% included)
- Physical-Chemical treatment WWTP outlet
- Biological WWTP outlet

Parameters and Instrumentation

"DIGISENS" SMART PROBES AND "INTELLACT" ONLINE ANALYZERS - APPLICATIONS

SEWER AND
WASTE WATER
AND
DRINKING WATER
TREATMENT

PRIMARY,
SECONDARY,
TERTIARY,



Sewer network Influent / Effluent

pH, DO, COD, BOD, TSS, NO₃, NO₂, NH₄-N, PO₄, TOTAL COLIFORM, TOXICITY, ALGAE, FREE CHLORINE, OZONE ETC..

for process control, process assessment, composition check of bio load, incoming nutrients, and finally validation for release as per statutory requirements.

Industrial network Influent / Effluent

pH, DO, COD, BOD, TSS, NO₃, NO₂, NH₄-N, COLOR, TOTAL COLIFORM, TOXICITY, ALGAE, FREE CHLORINE, OZONE ETC..

for process control, process assessment, composition check of bio load, incoming nutrients, and finally validation for release as per statutory requirements.

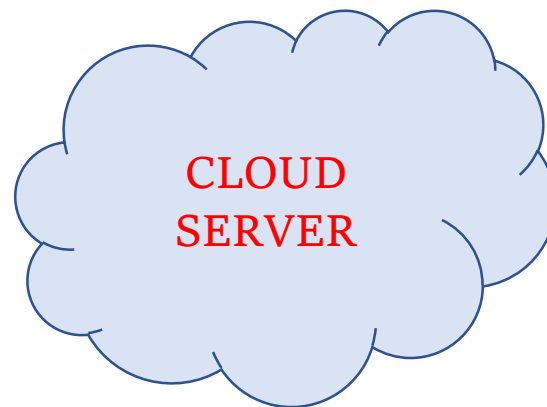
Drinking Water network Inlet / Outlet

pH, DO, COD, BOD, TSS, NO₃, NO₂, NH₄-N, TOTAL BACTERIAL COUNT, CHEMICAL TOXICITY, TURBIDITY, ALGAE, FREE CHLORINE, OZONE ETC..

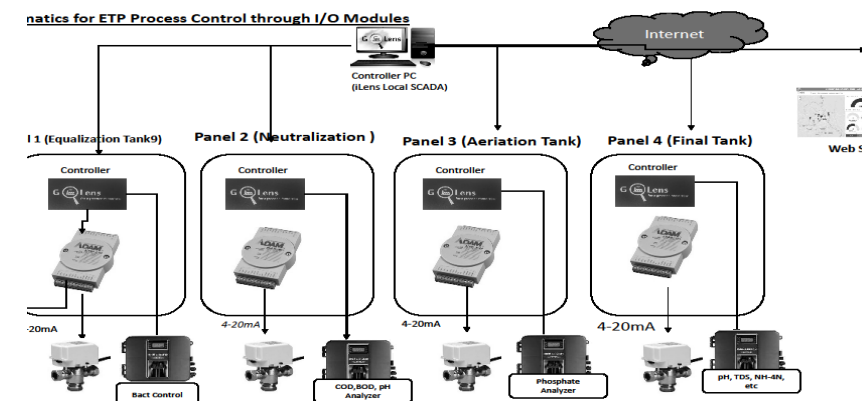
for process control, process assessment, incoming nutrients, and finally validation for release as per statutory requirements.

Parameters and Instrumentation

"DIGISENS" SMART PROBES AND "INTELLACT" ONLINE ANALYZERS – ONLINE REMOTE CLOUD DATA MONITORING AND “WIRELESS” REMOTE PROCESS CONTROL



GSM / GPRS / LORA CONNECTIONS



Parameters and Instrumentation

"DIGISENS" SMART PROBES AND "INTELLACT" ONLINE ANALYZERS - CONCLUSION

INTELLECT SERIES SENSORS AND ANALYZERS OFFERS COMPLETE TURNKEY SOLUTION FOR MEASUREMENT OF WATER QUALITY PARAMETER FOR ETP / STP AND DRINKING WATER

WHY TRUST "DIGISENS" SMART PROBES AND INTELLECT SERIES ANALYZERS FOR MY WATER QUALITY MEASUREMENTS

MORE THAN 50 YEARS OF TRUSTED EXPERIENCE IN MANUFACTURING OF SENSORS AND ANALYZERS

DIRECT INTERGRATION TO PLC/DCS, MODEMS, CONTROL SYSTEMS, ETC.. VIA RS 485 MODBUS COMMUNICATION ELIMINATES EXTRA COST OF TRANSMITTERS

TECHNOLOGY COMPLETELY IN COMPLIANCE WITH LATEST GUIDELINES OF CPCB FOR WATER QUALITY MONITORING. TECHNOLOGIES VALIDATED BY USEPA

LATEST I/O DEVICES FOR COMPLETE AUTOMATION

REMOTE SUPPORT VIA TEAM VIEWER FOR MINIMUM DOWN TIME

ONLINE REAL TIME SCHEDULED TRANSFER TO VALIDATED SERVERS FOR COMPLETE COMPLIANCE GLOBALLY INSTALLED BASED INCLUDING INDIA

Do you have any Questions and Queries??

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