Online water analysers

TETHYS INSTRUMENTS

Specialist Of UV Spectroscopy

> Innovation applied to online analysers

Tethys Instruments *is a young team of engineers developing innovative solutions around UV and IR spectroscopy.*

The team has multidisciplinary skills in optics, physics, chemistry, mechanics, electronics and software to cover all the fields necessary to develop and produce cutting-edge online analysers.
A long experience on manufacturing makes the production efficient and flexible with a high level of quality.

Several innovative technologies have been developed internally to achieve a high level of reliability and performance for online monitoring such as xenon flash lamp that gives an unparalleled lamp life-time; concave gratings coupled to 2048 pixels charge-coupled devices (CCD) for high resolution and sensitivity, high speed digital signal processor (DSP) that supports sophisticated algorithms and gives a high selectivity on the data-analysis.

Great efforts have been put on an user-friendly interface to ease the start up and the use of the analysers. Software updates and configuration backup/restore are done by USB keys on all our products.

A worldwide network of agents provides all the support required by the online instrumentation

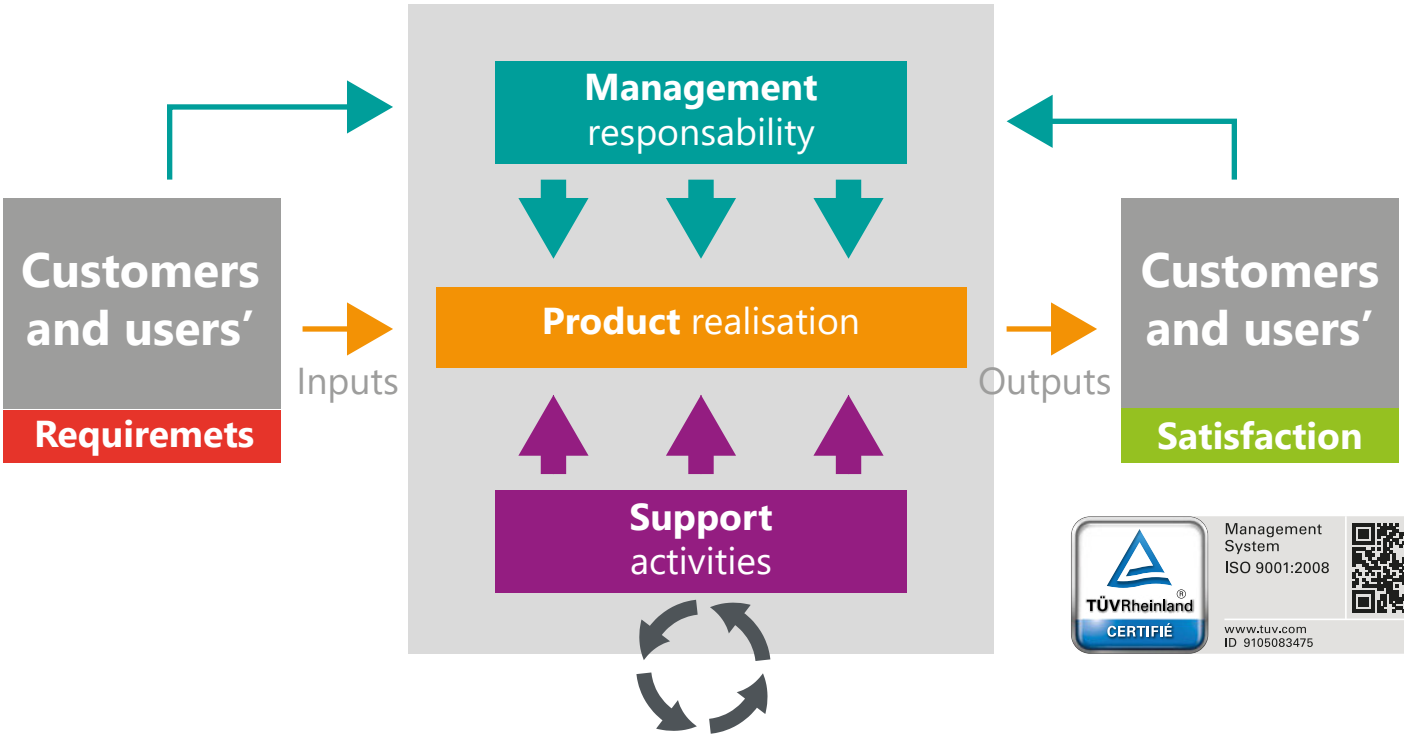
> To commit for you

***Our ambition** : to be a reference in our market of continuous monitoring analysers.*

For this, we are committed to :

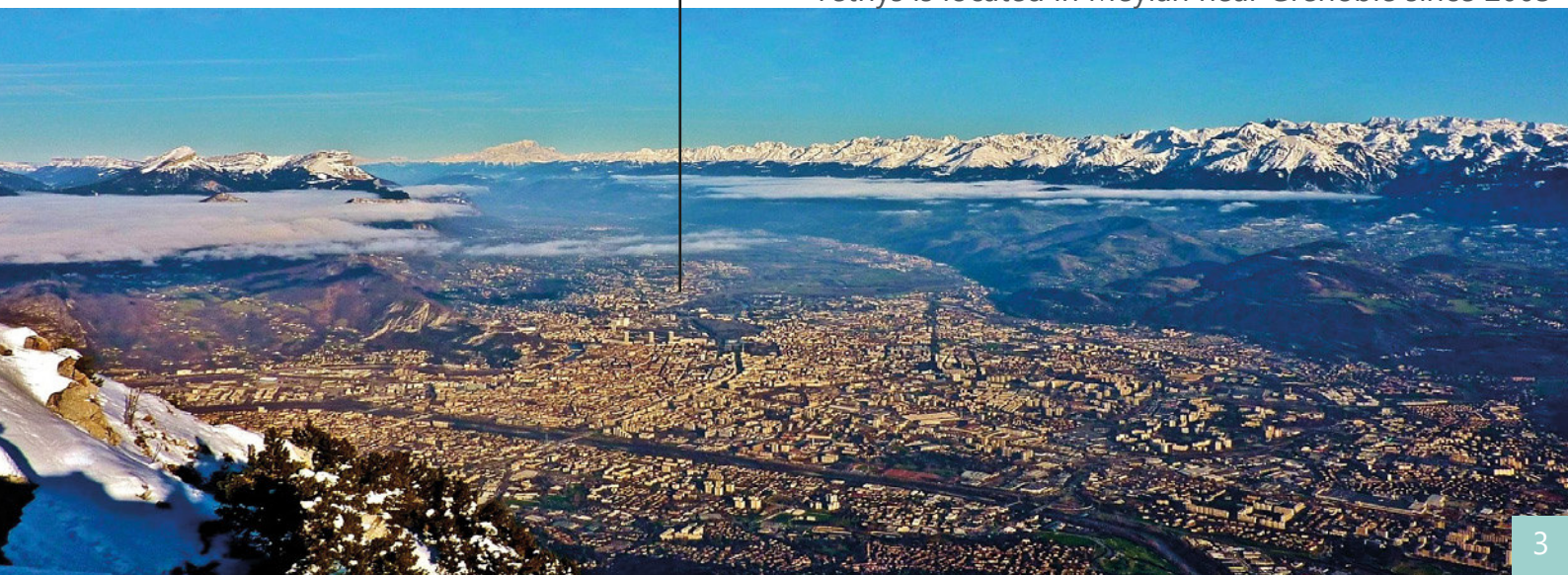
- Develop the quality and performances of our products
- Innovate to reach the expectations of our customers.
- Continuously improve our processes to satisfy our customers.
- Assure a prosperous working environment where the stability and security of our members is guaranteed.
- Contribute to the protection of the Environment by our products.

We are a young, multicultural, creative, dynamic and responsive team, who is always available and listening to the needs of our clients. The choice of a quality managing system based on the principles of the ISO 9001 International Standard is a way to fulfill our ambition and to build our commitments.



Management System ISO 9001:2008
TÜVRheinland CERTIFIÉ
www.tuv.com ID 9105083475

Tethys is located in Meylan near Grenoble since 2003



> Products

UV 400

UV 500

UV 300

NH4 on municipal & industrial incinerator, Netherlands

EL 300

NH4, NO3, PO4, COD, Turb., pH, DO, cond. on municipal WWTP, Turkey

> Applications

UV 500

UV 400

UV 300

EL 300

Modular concept: 1 to 16 parameters

		UV254 COD	NH_4	PAH	NO_3	H_2S	Colour	Chl.A*	PO_4	NO_2	Cl_2	Al	Fe	SiO_2	Cr-VI	Turb.	pH	ORP	DO	Cond	Temp.
River, lake		■	■	■	■		■	■	■						■	■	■		■	■	■
Drinking water		■			■		■			■	■	■	■		■	■	■			■	■
Municipal waste water		■	■		■	■			■	■						■	■	■	■	■	■
Industrial waste water	Food and drinks	■	■				■		■					■		■	■	■	■	■	■
	Paper / wood	■	■			■	■		■							■	■	■	■	■	■
	Chemical	■	■	■			■		■					■	■	■	■	■	■	■	■
	Petrochemical	■	■	■		■	■		■							■	■	■	■	■	■
	Power plants	■	■	■					■					■		■	■	■	■	■	■
	Metals	■	■				■		■						■	■	■	■	■	■	■

* = *Chlorophyll A*

COD, NH4, PAH for Environmental Agency, China

NH4 on waste water treatment plant, USA

NO3, COD, PO4, Turb., DO, Cond. for river monitoring, France

> ATEX applications

For application on explosive or potentially explosive area like refineries, an ATEX version of the UV400 is available with a air purge system.

The main parameters concerned by this kind of applications are the hydrocarbons measured by UV fluorescence, ammonia (NH4+) or dissolved hydrogen sulfide (H2S) measured on gaseous phase after stripping, and COD equivalent obtained by a correlation to UV absorbance.

A thermostatic vortex cooler can be installed as an option to maintain a moderate temperature inside the enclosure for outside use with high ambient temperature.

After certification, a marking plate can fixed on the enclosure with the specified marking, example :

II 3 G Ex [pz] IIC T3

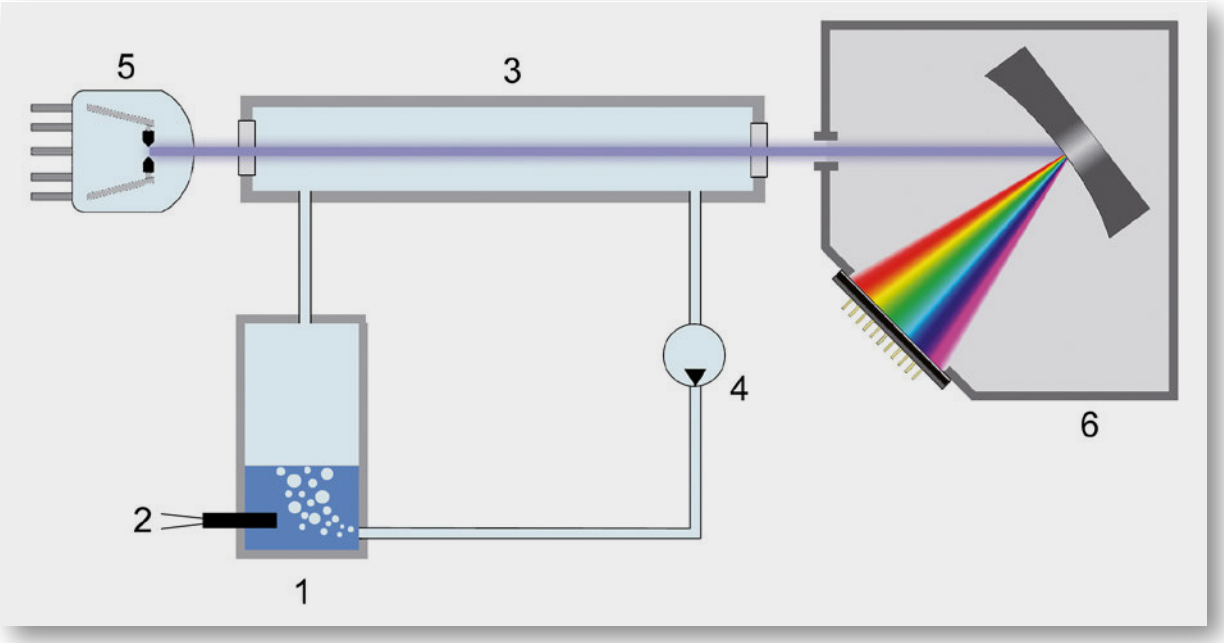
PAH on hydrocarbon storage, Netherlands

PAH on Refinery, Netherlands

> Ammonia and H2S: a unique method

This unique method has been developed by the founder of Tethys Instruments. It gives an exceptionally selective measurement for ammonia or hydrogen sulphide, without any drift as an automatic zeroing is performed on each measurement on ambient air.
The ammonia and hydrogen sulfide measurement are based on the UV absorption of the ammonia gas or hydrogen sulfide gas after a stripping phase, suppressing totally any effect of turbidity or colour of the sample.

The ammonia gas has a typical periodic absorption spectrum that is analyzed using a fast Fourier transform (FFT) that brings an exceptional selectivity.



1: stripping pot, / 2 : temperature probe, / 3 : gas flow cell, / 4 : gas pump, / 5 : xenon flash lamp, / 6 : spectrograph

NH4, COD, NO3, Turb. on municipal WWTP, Turkey

NH4 on municipal & industrial incinerator, Netherlands

> Technical description

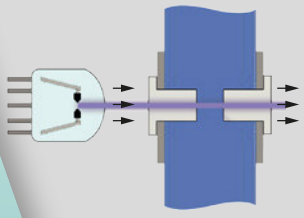
Optical Principle : UV Spectroscopy

- UV spectroscopy assumes fast and accurate measurements with a high reliability and very low maintenance.
- The patented flow cell allows very high level of suspended solid without clogging. The turbidity is automatically compensated by a dual-wavelength method.
- The UV source is a xenon flash lamp specified for 10^9 flashes that corresponds to more than 10 years of life time with one measurement every minute.
- A 2048 pixels high resolution spectrograph is the master part of the UV500. It allows to acquire the complete UV-visible absorbance spectrum of the water sample and the possibility to choose the wavelengths for parameters like COD, NO_3, Colour, PO_4, Cr_6 .
- Physico-chemical measurements like pH, ORP, dissolved oxygen, conductivity can be added to the internal measurements by using external probes. The dissolved oxygen probe is based on fluorescence method for a lower maintenance and higher stability.

Low Maintenance

To avoid deposits on the optical windows and tubing, all the analysers have a built-in automatic cleaning system that injects a 5% sulphuric solution normally once day. An auto-zero is performed at the same time to avoid any drift of the measurement.

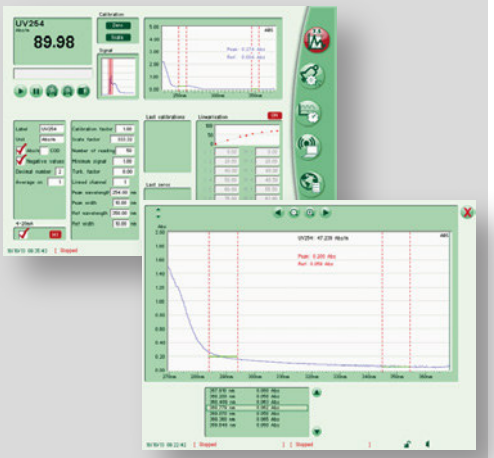
The patented flow-cell limit the risk of clogging inside the flow cell.



User-Friendly Interface

A colour touch screen display interface allows the user to easily navigate through a number of screens that are used to set and check all of the operating conditions of the instrument.

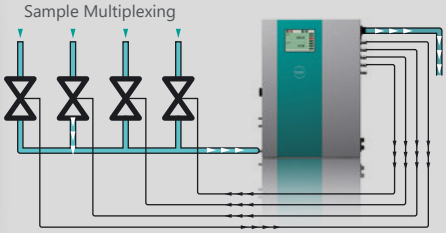
A protective film limits the risk to damage the surface of the touch screen, especially against solvent and corrosive liquid.



Multiplexing System

When different streams need to be analysed, for example inlet and outlet of a plant, a optional multiplexing system delivers relay contacts to control external electric-valves or external pumps.

The measuring channels can be either duplicated (each one having its own 4-20mA output or MODBUS register), or measured sequentially to fit with the maximum of 16 measuring channels (a MODBUS register indicates which stream is currently being measured).



Web interface

The new web interface makes possible to drive remotely the analyser from any computer, tablet or i-phone with a web browser. For this, an optional Wi-Fi or Ethernet module is added inside the analyser to connect it to an existing network with an internet gateway.

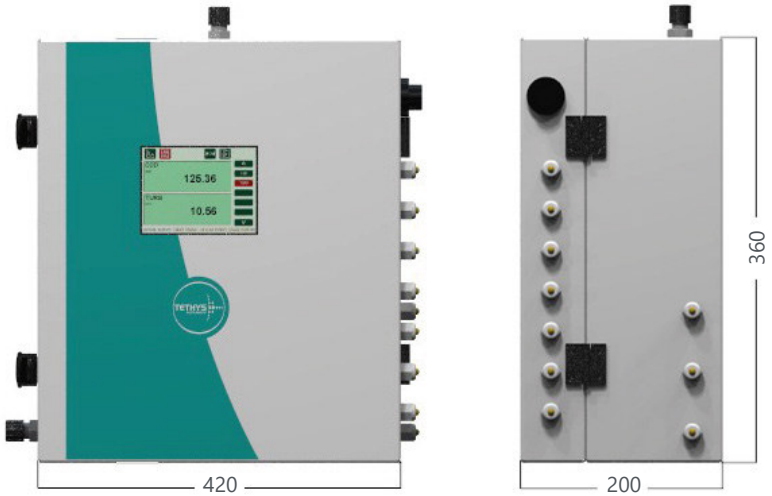
> Parameters specifications

Parameters	Standard Range *Other range on request*	 UV 500	 UV 400	 UV 300	 EL 300
UV254 (COD by correlation)	0 - 200 Abs/m (0-100 mg/l COD on river water) 0 - 600 Abs/m 0 - 2000 Abs/m (0 - 20,000 mg/l COD on municipal waste water)	● ● ●	● ● ●	● ● ●	
Ammonia	0 - 100 mg/l NH_4	●	●		
Nitrate	0 - 100 mg/l NO_3	●	●	●	
Colour	0 - 100 Pr-Co 0 - 1000 Pr-Co	● ●	● ●	● ●	
Aromatics Hydrocarbons (PAH)	0 - 10 mg/l C_6H_6	●	●	●	
Chlorophyll A	0 - 100 µg/l CHL.A		●	●	
Phosphate	0 - 2 mg/l P-PO_4 0 - 20 mg/l P-PO_4	● ●	● ●	● ●	
Chlorine	0 - 5 mg/l Cl_2			●	
Nitrite	0 - 5 mg/l NO_2			●	
Aluminium	0 - 500 ppb Al			●	
Iron	0 - 2 mg/l Fe			●	
Silica	0 - 20 mg/l SiO_2			●	
Hydrogen Sulphide	0 - 20 mg/l H_2S	●	●		
Cr (VI)	0 - 2 mg/l Cr (VI)	●		●	
Turbidity (TSS by correlation)	0 - 100 NTU 0 - 1000 NTU	● ●	● ●	● ●	
pH	0 - 14	●	●	●	●
ORP	+/- 2000 mV	●	●	●	●
Dissolved Oxygen	0 - 25 mg/l O_2	●	●	●	●
Conductivity	0 - 2000 µS	●	●	●	●
Extrenal Turbidity (TSS by correlation)	0 - 1500 mg/l TSS 0 - 30,000 mg/l TSS	● ●	● ●	● ●	● ●
Temperature	0 - 80 °C	●	●	●	●

> Dimensions

> EL 300

> UV 300



> UV 400

> UV 500

> General specifications

Specifications	Descriptive	 UV 500	 UV 400	 UV 300	 EL 300
Sample Flow	Recommended: 0 - 5 l/min 0 - 0,5 l/min for NH_4 or H_2S	● ●	● ●	●	
Sample pressure	0 - 4 Bar (0 - 1 Bar with sampling peristaltic pump) 0 - 0,5 Bar for NH_4 or H_2S	● ●	● ●	●	
Sample temperature	0 - 60 °C 0 - 80 °C 0-30 °C for NH_4 or H_2S	 ● ●	 ● ●	 ●	●
Wet parts materials	Quartz, Polypropylene, Polyethylene, FPM (viton), PMMA (+ Pharmed and glass for NH_4 or H_2S) PVC, Carbon, Polyphenylene sulfide (Ryton), Glass	● ●	● ●	●	 ●
Measuring time	< 5 sec 5 sec (except PO_4, NO_2, Fe, Cr (VI) : 3 min / Cl_2, Al: 2 min / SiO_2: 6 min) 5 sec (except PO_4, NH_4, H_2S, Cr (VI) : 3 min)	 ●	 ●	 ●	●
Measurement interval	1 min to 720 min (If measuring time compatible) 1 min to 720 min (except PO_4, NH_4, H_2S : 4 min) Physicochemical parameters may be continuous Continuous or periodic, 1 min to 720 min	 ● ●	 ● ● 	● ● 	 ●
Memory	5000 lines of measurements (up to 16 channels) with date and time	●	●	●	●
Consumption	Cleaning solution (5% sulfuric acid): 220 ml/day Reagent for PO_4 : 2 ml per measurement NaOH 10% for NH_4: 2 ml per measurement HCl 10% for H_2S: 2 ml per measurement : Reagent per measurement : Al : 0.5 ml / Cl_2, PO_4, Fe, NO_2, Cr (VI): 0.6 ml / SiO_2 :1.2 ml	● ● ● ● ●	● ● ● ● ●	● ●	
Maintenance interval	Recommended: 6 months to 1 year (except for refilling)	●	●	●	
Power supply	90- 264 VAC 50/60 Hz 40 VA - 12V DC 3A maxi (except for NH_4 or H_2S) 90- 264 VAC 50/60 Hz 80 VA	 ●	● ● 	●	●
Screen	Colour TFT LCD 320x240 pixels with LED backlight Colour TFT LCD 640x480 pixels with LED backlight	 ●	●	●	●
Communication	RS232 with MODBUS Protocol HTTP/Web interface, Compatible with : Windows7 with IE 9, Nexus 7 tablet under Android with Opera 12.10, Apple I-phone 4S with Safari RS485 for external probes (DO, TSS) USB WI-FI (IEEE802.11B) optional Ethernet (IEEE802.3) optional	● ● ● ● ●	● ● ● ● ● ●	● ● ● ● ● ●	● ● ● ● ● ●
Certifications	CE, EN 61010-1, EN 61326	●	●	●	●
Enclosure	Stainless Steel with epoxy coating, IP65, wall mounting brackets Stainless Steel with epoxy coating, IP54 (IP65 as option), wall mounting brackets	●	 ●	●	●
Dimensions	300 x 200 x 110 mm 420 x 360 x 200 mm 520 x 390 x 220 mm 525 x 345 x 260 mm	 ●	 ● 	 ● 	●
Weight	6 kg approx. 15 kg to 20 kg depending on the configuration 20 to 30 kg depending on the configuration	 ●	 ●	 ● 	●

> They Trust In Us

TETHYS Instruments
57, Chemin du vieux Chêne, 38240 MEYLAN -France-

Tel : +33 4 76 41 86 39 - Fax : +33 4 76 41 92 27
Mail : sales@tethys-instruments.com
Web : www.tethys-instruments.com

Management System ISO 9001:2008
www.tuv.com ID 9105083475

Crédits photos :
© Tethys Instruments
Couverture : © Sonchai Jongmeesuk / agence 123rf
Page 8 : © Bagiuiani / agence 123rf