

**Focused Photonics (HangZhou) Inc.**

760 Bin'an Road, Binjiang District  
Hangzhou 310052  
China

Tel: +86 571 8501 2188  
Fax: +86 571 8501 2006

[www.fpi-inc.com](http://www.fpi-inc.com)



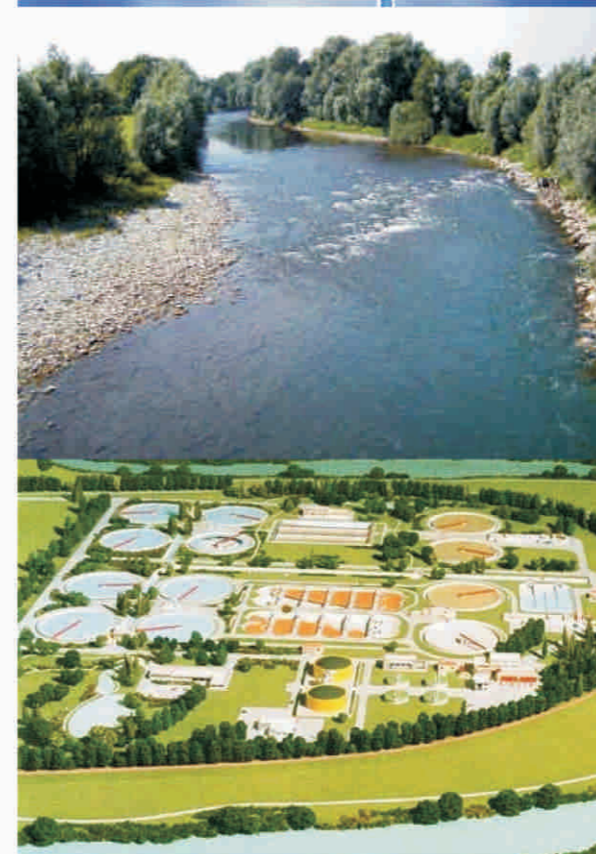
**ONLINE WATER QUALITY  
MONITORING SYSTEM**

**Focused Photonics Inc.**

Smarter Tech Greener World



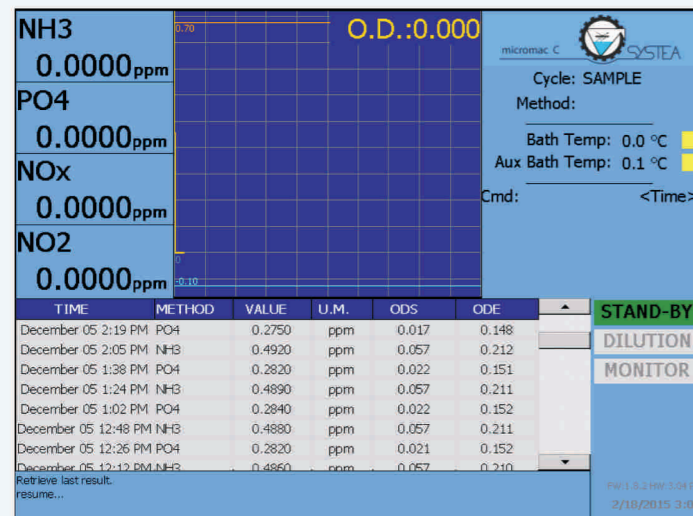
## MICROMAC ON LINE ANALYZERS



ON LINE ANALYZERS FOR  
POTABLE, SURFACE  
AND WASTE WATER  
MONITORING



# MICROMAC ON LINE ANALYZERS



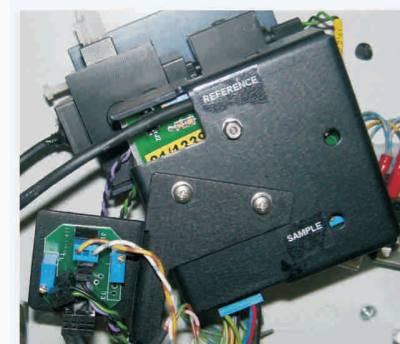
## TOUCH SCREEN OPTION

### ROBUST AND RELIABLE

Designed for industrial and environmental on-line applications, ensures the highest level of robustness in the electronics, mechanics and hydraulics components. With a complete separation between electronics and hydraulics and a simple and robust LFA\* hydraulics, it allows long term and reliable operations.

### EASY TO INSTALL

The analyzer is delivered only after a successful final tests. It is provided ready for installation, with a spares set for start-up operations.



MICROMAC C - COLORIMETRIC



MICROMAC E - ISE DETECTOR

### AUTOMATIC CALIBRATION

The analyzer performs automatic calibration, the new calibration factor is checked and accepted if inside acceptance limits.

### MEASUREMENT FREQUENCY

User selectable; between two measurements the analyzer remains in stand-by mode, without reagents consumption.

### OFF SCALE REANALYZE

The analyzer identifies off scale samples and reanalyze the sample after automatic dilution

### FEATURES/BENEFITS

- Easy and friendly operator interface
- Fully automatic operation
- Long autonomy; low maintenance, low operating cost
- Low reagent or nearly no consumption
- Easy operation; fully documented plug in analyzer, no special training is required
- Electronics and hydraulics completely separated
- RS232 bidirectional for remote control
- USB port for data download
- Yearly maintenance

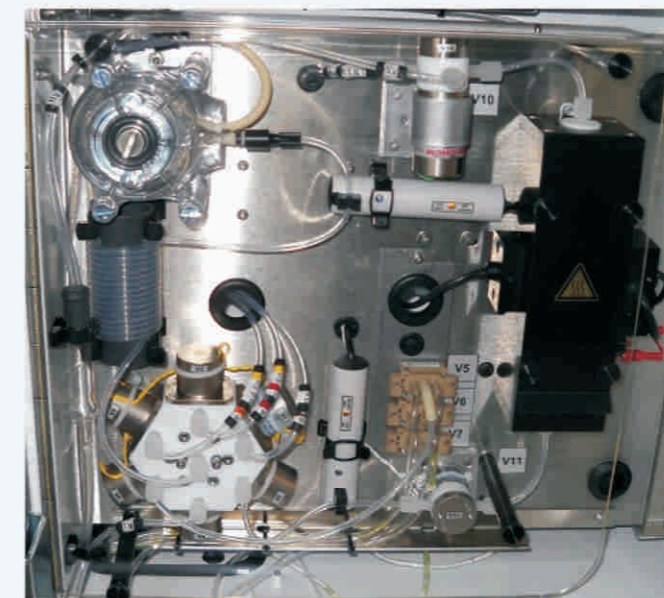
### MICROMAC ON LINE

Microprocessor controlled analyzers specifically designed for automatic monitoring on several types of water matrices.

### MODELS AND DETECTORS

- MICROMAC C - COLORIMETRIC
- MICROMAC E - ISE
- MICROMAC TOC - NDIR
- MICROMAC UV - UV RANGE

# DEDICATED APPLICATIONS



### MICROMAC COD- Cr

Fully automated COD Analyzer

ISO/EPA METHOD (Dichromate/Sulfuric acid)

MEASURING TIME: 20 -60 min. depending on sample matrix

Standard ranges:

0-50/100/200/500/1000/2000/5000/10000/20000 ppm COD

### MICROMAC TOC

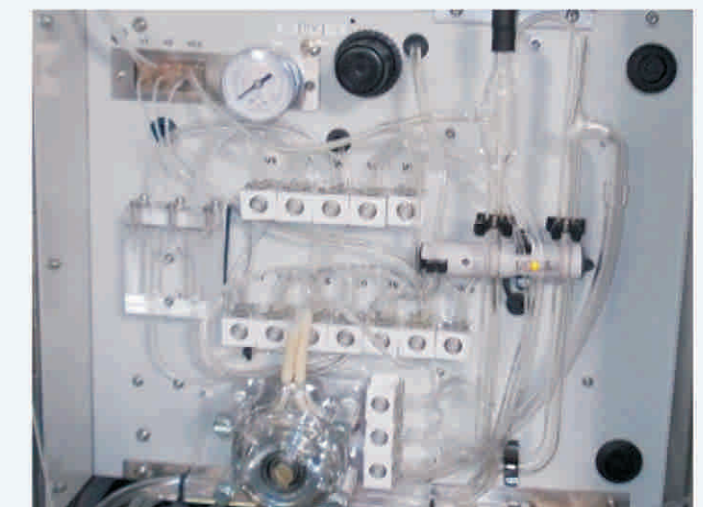
Fully automated TOC Analyzer

ISO/EPA NDIR METHOD

MEASURING TIME: < 17- 25 min. depending on sample matrix

Standard ranges:

0-5/20/50/100/150/500/1000 ppm C



### MICROMAC CFA - Applications

#### Cyanide-Free & Total

(EPA n. 335.3 ISO-14403\_2002-03)

Standard Range: 0-0,1/0,2/0,3/0,5/1,0/2,0ppm

MEASURING TIME: < 35 min.

#### Volatile Phenols

(EPA n. 420.2; ISO/DIN 14402:1999)

Standard Range: 0-0,3/0,5/1,0/ 2,0ppm

MEASURING TIME: < 30 min.

#### Total Cadmium

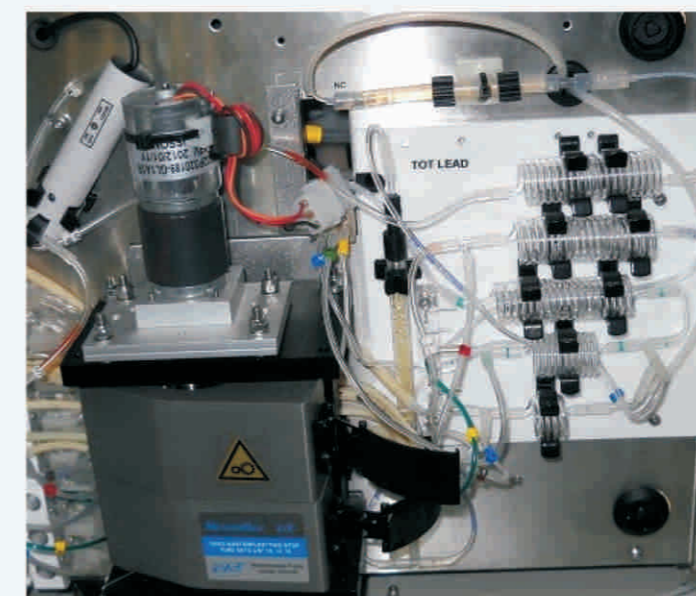
Standard Range: 0-0,1/0,3/0,5/ 1,0ppm

MEASURING TIME: < 40 min.

#### Total Lead

Standard Range: 0-1.0/2.0/3,0ppm

MEASURING TIME: < 40 min



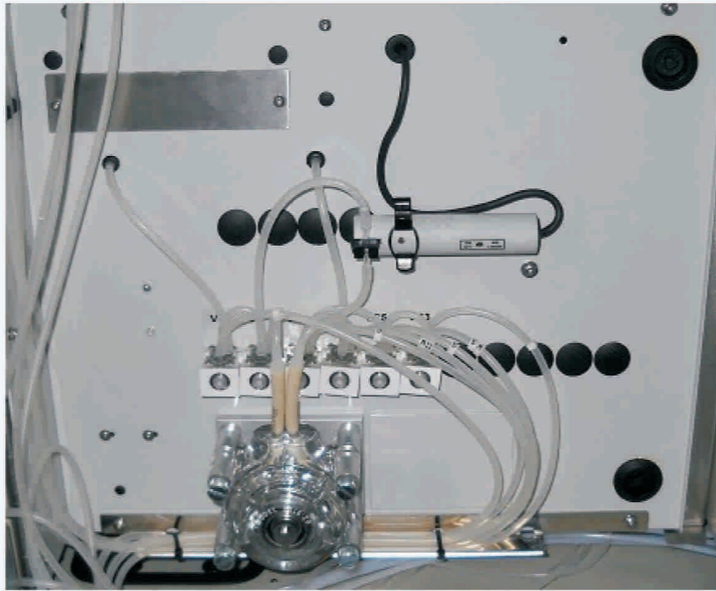
## UV APPLICATIONS

### MICROMAC UV

**COD/TOC** direct reading at 254nm, turbidity correction as per DIN 348404-3

**NITRATE:** direct reading at 220nm organic substances correction as per 4500-NO<sub>3</sub> B.

**TOTAL NITROGEN:** UV persulfate oxidation of nitrogen form to NO<sub>3</sub>, the direct measure at 220nm as per ISO 11905 1:1997(E) - Annex C; C4



## SAMPLE PRETREATMENT



### SELF CLEANING FILTRATION UNIT

Installed close to the analyzer allow to remove suspended solids. The filtration unit runs periodically a self cleaning cycle, using compressed air . One filtration unit can be used to supply a clean water sample up to 10 analyzers.

### EASY TO INSTALL

Delivered completely assembled on a stainless steel frame, ready for connections

### LOW MAINTENANCE

Self cleaning cycle and long life pump tube ensures low maintenance cost.

### ANALYZER CONTROLLED

Micromac activates the filtration unit only when the analytical cycle starts.

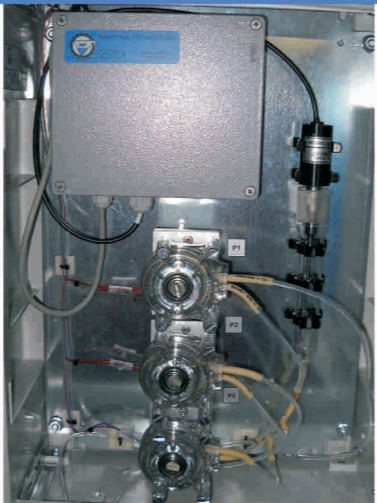
### STAINLESS STEEL FILTER

A stainless steel filter ensures long operation and no corrosion with the most common matrix.

### SAMPLE HOMOGENIZER

Installed close to the analyzer allow to homogenize samples before COD, TP, TN measurements.

Includes and ultrasonic homogenizer fully controlled by the analyzer hardware, the sample after homogenizing cycle is pumped inside the analyzer that starts the analysis cycle.



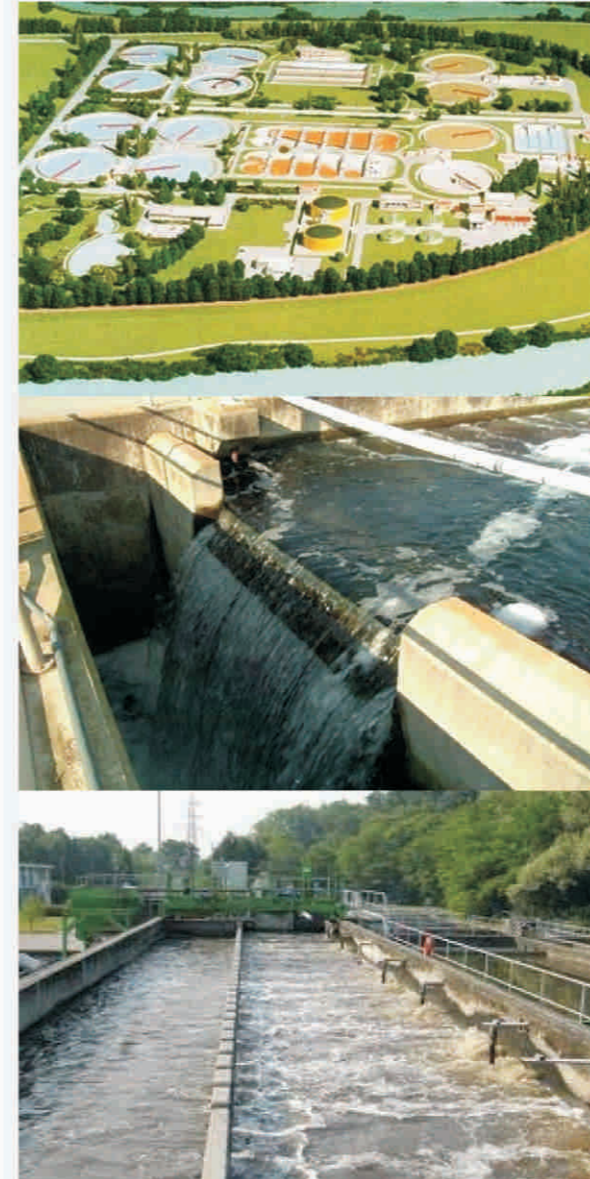
## STANDARD APPLICATIONS

Application	Measuring range	WW	SFW	DW	SW
Alkalinity (methyl orange)	0-100ppm up to 20g/L CaCO <sub>3</sub>	☺	☺	☺	
Alluminum	0-0.4 up to 10 ppm Al <sup>2+</sup>	☺	☺	☺	☺
Ammonia (colorimetric)	0-0.2 up to 200 ppm N-NH <sub>3</sub>	☺	☺	☺	☺
Ammonia (fluorimetric)	0-0.2 up to 1.0 ppm N-NH <sub>3</sub>		☺	☺	☺
Arsenic Total dissolved	0- 0.02 up to 0.5 ppm	☺	☺	☺	
Arsenic Total	0-0.02 up to 0.5 ppm	☺	☺	☺	
Boron	0-2 up to 50 ppm B		☺	☺	☺
Cadmium Total/Dissolved	0-100 up to 500 ppb	☺	☺	☺	
Calcium	0-5 up to 200 ppm Ca <sup>2+</sup>	☺	☺	☺	
Chloride	0-100 up to 500 ppm Cl <sup>-</sup>	☺	☺	☺	
Chlorine Free/Total	0-0.5 up to 10 ppm Cl <sub>2</sub>	☺		☺	
Chromium 6 <sup>+</sup>	0-0.3 up to 30 ppm Cr <sup>6+</sup>	☺	☺	☺	☺
Chromium Total	0-1 up to 20 mg/L Cr <sup>6+</sup>	☺	☺	☺	
COD (Dichromate)	0-50 up to 500 ppm COD	☺	☺		
COD (Permanganate)	0-50 up to 500 ppm O		☺	☺	
COD (UV 254nm)	0-50 up to 500 ppm COD	☺	☺		
Color	0-100 up to 500 Pt/Co Units	☺	☺		
Copper	0-0.1 up to 20 ppm as Cu	☺	☺	☺	☺
Copper Total	0-0.4 up to 5 ppm as Cu	☺	☺		
Cyanide Tot/Free (UV,Dist)	0-0.2/0.5/10/20 ppm CN	☺	☺	☺	
Cyanide Index	0-0.3 up to 300 ppm as CN	☺	☺		
Ethylene glycol	0-15 up to 50 ppm EG	☺			
Fluoride	0.02-1/10/50/100 ppm F <sup>-</sup>			☺	
Hardness	0-10 up to 500 ppm CaCo <sub>3</sub>	☺	☺	☺	
Hydrazine	0-0.1 up to 5 ppm	☺	☺		
Iron Total dissolved	0-0.1 up to 1000 ppm Fe <sup>2+</sup>	☺	☺	☺	☺
Iron Total	0-0.1/0.5/1/2/5 ppm	☺	☺	☺	
Lead Total/Dissolved	0-1 ppm up to 20 ppm Pb <sup>2+</sup>	☺	☺		
Manganese	0-0.5/1/2.0/5.0/20 ppm Mn <sup>2+</sup>	☺	☺	☺	☺
Manganese Total	0-2 ppm Mn <sup>2</sup>	☺	☺		
Monochloram. & Total NH <sub>3</sub>	0-2 up to 5 ppm N		☺	☺	
Nickel	0-0.5 up to 30 ppm Ni	☺	☺	☺	☺
Nickel Total	0-1.0 up to 20 ppm Ni	☺	☺		
Nitrate+Nitrite Hydrazine	0-5 up to 1000 ppm N-NO <sub>3</sub>	☺	☺	☺	
Nitrate+Nitrite UV photored.	0-0.2 up to 1000 ppm N-NO <sub>3</sub>	☺	☺	☺	☺
Nitrate (UV 220nm)	0-5 up to 50 ppm N-NO <sub>3</sub>		☺	☺	
Nitrite	0-0.05 up to 20 ppm N-NO <sub>2</sub>	☺	☺	☺	☺
Nitrogen Total (Colorimetric)	0-5 up to 1000 ppm N	☺	☺	☺	☺
Total Nitrogen (UV)	0-5 up to 100 ppm N	☺	☺	☺	
Phenol Volatile	0-500 ppb	☺	☺		
Phenol Index	0-0.1 up to 0.50 ppm	☺	☺		
Ortophosphate	0-0.2 up to 200 ppm P-PO <sub>4</sub>	☺	☺	☺	☺
Silicates	0-0.2 up to 200 ppm SiO <sub>2</sub>		☺	☺	☺
Sucrose	0- 100 up 1000 ppm	☺			
Sulfide	0-2 ppm S <sup>2-</sup>	☺	☺	☺	☺
TOC	0-20 mg/l up to 1000 mg/l C	☺	☺	☺	☺
Total Phosphorous	0-1 up to 200 ppm P	☺	☺	☺	☺
Zinc	0-0.5 up to 1000 ppm Zn <sup>2+</sup>	☺	☺	☺	☺
Zinc Total	0-0.5 up to 0-1000 mg/L Zn <sup>2+</sup>	☺	☺		

WW = Waste Water; SFW = SurFace Water; DW = Drinking Water, SW = Sea Water

Technical Data	
<b>MEASURING PRINCIPLE</b>	Colorimetric -dual beam, ISE (Ion Selective Electrode), NDIR, UV
<b>MEASUREMENT TYPE</b>	Batch - Multi parametric version: batch, sequential & multi-wavelength
<b>MEASURING FREQUENCY</b>	Programmable
<b>MEASURING TIME</b>	From 5 minutes up to 60 minutes depending on the application
<b>MEASURING POINTS</b>	Up to 6
<b>OPERATOR INTERFACE</b>	Membrane keypad & Graphic display or colour graphic touch screen 8" (option)
<b>OUTPUT SIGNAL AND COMMUNICATIONS PORTS</b>	4-20mA separated per each method or stream, galvanic insulation option; RS232 output ; RS485 optional; RTU Modbus optional
<b>INPUT SIGNALS</b>	Analysis: 1 digital contact with photocoupler, galvanically isolated Calibration: 1 digital contact with photocoupler, galvanically isolated
<b>ALARM CONTACTS</b>	High Limit : 1 potential free switch SPDT, max load 24 AC DC 0.5 A separated for each stream Calibration: 1 potential free switch SPDT, max load 24 AC DC 0.5 A General: 1 potential free switch SPDT, max load 24 AC DC 0.5 A, separated for each stream
<b>ALARM MESSAGES</b>	On operator interface
<b>SAMPLE DELIVERY</b>	Pressure: atmospheric Temperature: 10° - 35 °C Volume: 50/80 mL per analysis depending on analyzer model Connection: Standard silicone 2x4, other on request Waste: pressure free silicone 2x4 mm
<b>REAGENTS REPLACEMENT</b>	From 3 to 5 weeks depending on the measurement frequency
<b>ENVIRONMENTAL TEMP.</b>	10-45°C (Reagents up to 25°C)
<b>MOUNTING</b>	Wall mounting
<b>STANDARD PROTECTION</b>	IP 55, IP 65 optional on request
<b>HARDWARE</b>	PC104 standard microcontroller, integrated 8" colour touch screen
<b>POWER SUPPLY</b>	12 Vcc; external power supply from 110/220 Vac to 12 Vcc included in the scope of delivery
<b>ABSORPTION</b>	4W stand by, 10 W analysis
<b>WEIGHT</b>	30 Kg without reagents
<b>DIMENSIONS</b>	800x420x280 mm (hwxwd)
<b>SELF CLEANING FILTER</b>	
<b>POWER SUPPLY</b>	12Vdc
<b>SAMPLE PRESSURE/RATE</b>	min 0.3 bar/30 l/h max 1 bar
<b>COMPRESSED AIR FOR SELF CLEANING</b>	max 2 bar

Subject to change without notice

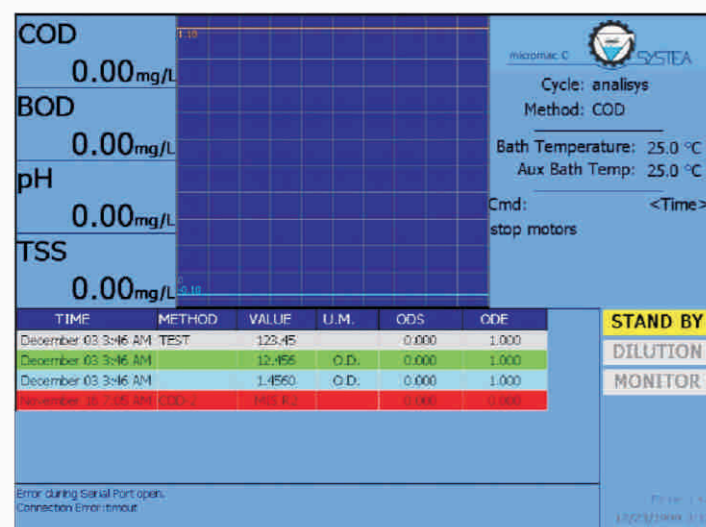


## MICROMAC ECO

ON LINE ANALYZER FOR  
COD/BOD/TSS/pH



# MICROMAC ECO ON LINE ANALYZER



**MICROMAC ECO** is a microprocessor controlled on-line analyzer, specifically designed for automatic monitoring inside WWTP

## ROBUST AND RELIABLE

Designed for industrial and environmental on-line applications, it ensures the highest level of robustness in the electronics, mechanics and hydraulics components. With a complete separation between electronics and hydraulics and a simple and robust hydraulics allows long term and reliable operations.

## EASY TO INSTALL

The analyzer is delivered from factory only after a successful final tests. It is provided ready for installation, with a spares set for start-up operations.

## AUTOMATIC CALIBRATION

The analyzer performs automatic calibration, the new calibration factor is checked and accepted if inside acceptance limits.

## MEASURING INTERVAL

User selectable; between two measurements the analyzer remains in stand-by mode, without reagents consumption.

## OFF SCALE REANALYZE

The analyzer identifies off scale samples and reanalyze the sample after automatic dilution

## FEATURES/BENEFITS

- ❑ 8" Colour touch screen
- ❑ Fully automatic operation
- ❑ Long autonomy; low maintenance, low operating cost
- ❑ Nearly no reagents
- ❑ Easy operation; fully documented plug in analyzer, no special training is required
- ❑ Electronics and hydraulics completely separated
- ❑ Serial interface for PC or printer connection (optional)
- ❑ Yearly maintenance



pH Flow Cell with electrode



UV Detector for COD or TOC

## MICROMAC ECO MODELS

**MICROMAC COD UV:** SAC direct reading at 254nm, turbidity compensation at 550nm as per DIN 348404-3, correlation with COD by known calibrant, this version can measure TOC as alternative to COD

**MICROMAC BOD FLUO:** direct fluorimetric measure (Tryptphan like), excitation at 280nm and measure at 360nm, correlation with BOD by a known Tryptophan calibrant, correlation factor to be confirmed/adjusted on site

**MICROMAC COD/BOD:** combined version to measure sequentially in a single analyzer COD UV and BOD FLUO

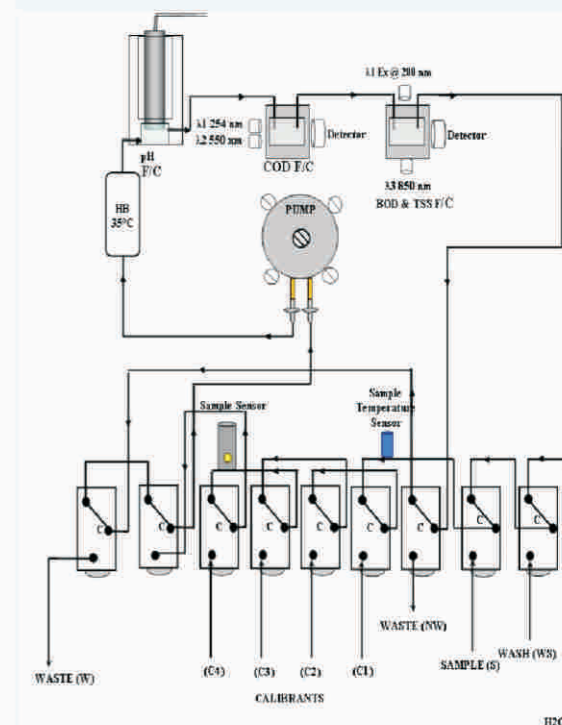
## COD UV and BOD FLUO options

**TSS option:** turbidity measure at 850nm as per ISO 7027, calibration with a known formazine standard, correlation with TSS to be established on site.

**pH option:** measure of pH trough pH combined electrode in flow trough cell at controlled temperature, result are given as pH at 20°C or 25°C.

## MICROMAC ECO MP4

**MICROMAC ECO** offer a full MP4 version to measure sequentially: COD UV/BOD FLUO/TSS/pH



MICROMAC ECO PRINCIPLE

## SELF CLEANING FILTRATION UNIT



For waste water or other dirty samples application a self cleaning filtration unit can be installed close to the analyzer.

Thanks to the integrated PLC, the filtration unit runs periodically a self cleaning cycle, using compressed air generated externally or even internally (as option).

One filtration unit can be used to supply a clean water sample up to 10 analyzers.

## EASY TO INSTALL

The filtration unit is delivered completely assembled on a stainless steel and PVC frame, ready for connection to a sample line. It is sufficient to connect the sample line, the waste line and the analyzer's sampling line.

## LOW MAINTENANCE

Self cleaning cycle and long life pump tube ensures low maintenance cost.

## ANALYZER CONTROLLED

Micromac activates the filtration unit only when the analytical cycle starts.

## STAINLESS STEEL FILTER

A stainless steel filter ensures long operation and no corrosion with the most common matrix.

Technical Data

MEASURING PRINCIPLE	COD UV: SAC at 254nm turbidity correction at 550nm as per DIN 348404-3; COD correlation against known calibrant BOD FLUO: Fluorimetric measure (tryptophan like) excitation ad 280nm, measure at 360nm; BOD correlation by Tryptophan calibrant to be adjusted and/or established on site TSS: turbidity measure at 850nm as per ISO 7027, correlation with TSS to be established on site. Standard Flow Cell pathlength 2.5mm other pathlength available on request : 3.0/5/10mm; LED lifetime: 5 years pH: combined pH electrode in flow trough cell, sample at controlled temperature, pH values temperature corrected
STANDARD RANGE	COD: 0-50/100/200/1000/2000/3000 mg/L BOD: 0-20/50/100/500 mg/L TSS: 0-20/50/100/500/1000 NTU pH: 0-14
MEASUREMENT TYPE	Batch, multi parametric version batch and sequential
MEASURING FREQUENCY	Programmable
MEASURING TIME	COD: 7-10min/BOD: 7-10min/TSS: 7-10min/pH: 7-10min; depending on the range and sample temperature, for combined versions 10-15min
NUMBER OF MEASURING POINTS	COD: up to 6 streams; BOD: up to 6 streams; COD/BOD: up to 3 streams; COD/BOD/TSS or pH: up to 2 streams; same range on all streams. MP4 version (full option units) only single stream
OUTPUT SIGNAL AND COMMUNICATIONS PORTS	4-20mA separated per each method or stream, galvanic insulation option RS232 output RS485 optional RTU Modbus optional
INPUT SIGNALS	Analysis: 1 digital contact with photocoupler, galvanically isolated Calibration: 1 digital contact with photocoupler, galvanically isolated
ALARM CONTACTS	High Limit : 1 potential free switch SPDT, max load 24 AC DC 0.5 A separated for each stream Calibration: 1 potential free switch SPDT, max load 24 AC DC 0.5 A General: 1 potential free switch SPDT, max load 24 AC DC 0.5 A, separated for each stream
ALARM MESSAGES	On 8" color touch screen
SAMPLE DELIVERY	Pressure: atmospheric Temperature: 10° - 35 °C Volume: 50/80 mL per analysis depending on analyzer model Connection: Standard silicone 2x4, other on request Waste: pressure free silicone 2x4 mm
REAGENTS	Not necessary only wash solutions and calibration solutions
ENVIRONMENTAL TEMP.	10-45°C
MOUNTING	Wall mounting
STANDARD PROTECTION	IP 55, IP 65 optional on request
HARDWARE	PC104 standard microcontroller, integrated 8" colour touch screen
POWER SUPPLY	12 Vdc; external power supply from 110/220 Vac to 12 Vdc included in the scope of delivery
ABSORPTION	4W stand by, 10 W analysis
WEIGHT	25 Kg without reagents
DIMENSION	800x420x280 mm (hwxwd)
SELF CLEANING FILTER	
POWER SUPPLY	12Vdc
SAMPLE PRESSURE	min 0.3 bar
SAMPLE RATE	30 l/h max 1 bar
COMPRESSED AIR FOR SELF CLEANING	max 2 bar

Subject to change without notice



WIZ

PORTABLE IN-SITU PROBE  
FOR  
WATER ANALYSIS



# WIZ IN-SITU PROBE FOR WATER ANALYSIS APPLICATIONS



- Ammonia (N-NH<sub>3</sub>)
- Orthophosphate (P-PO<sub>4</sub>)
- Nitrate + nitrite N-(NO<sub>3</sub>+NO<sub>2</sub>)
- Nitrite (N-NO<sub>2</sub>)
- Total Phosphorous (P)
- Total Nitrogen (N)
- COD/TOC
- BOD
- Turbidity/TSS
- Cr<sup>6+</sup>/Fe<sup>2+</sup>/Ni<sup>2+</sup>/Cu<sup>2+</sup>/Zn<sup>2+</sup>

& Many others

## ADVANTAGES AND BENEFITS

- ❑ **Multiparametric:** up to 4 parameters in the same unit.
- ❑ **Flexibility:** more than 10 multiparametric configuration already developed active methods selectable by control software.
- ❑ **Low reagents consumption:** few uL of reagents per analysis.
- ❑ **Low electrical consumption:** battery operated
- ❑ **Deployment Kit:** including buoy, warning lamp, batteries, batteries charger and solar panels available as option
- ❑ **Reagent canister:** easy to plug in, new reagent set can be plug on site w/o WIZ removal
- ❑ **Quick start up:** delivered fully tested and calibrated as per end user specifications, just fill the reagent canister & power to start up
- ❑ **Autowash/Autocleaning:** self wash and/or cleaning at the end of each measurement.
- ❑ **Control Software:** easy to use and to learn; short training, specifically designed for chemists.
- ❑ **QC control:** programmable QC check while deployed.
- ❑ **Filter options:** wide range of filter options, 10/25/100/400uM self cleaning or not or 0.25uM microfilter, self purging
- ❑ **Control options:** integrated firmware & internal data logging, data retrieve by PC software, external data logger for power On& OFF, analysis frequency, GPRS data transmission to control center. Remote control by combined use of Zetalog & Zetaced.
- ❑ **Zetalog:** Systea datalogger ready for WIZ & filtration unit control and data transmission to control center, allow in combination with Systea Zetaced control center the remote management of the probe
- ❑ **Zetaced:** Systea control center running on web server for WIZ and other sensors data management



REAGENT CANISTER



DEPLOYMENT KIT

## WIZ CONTROL PANEL:

Control Panel (WCP) software package allows to setup any WIZ probe, using an RS-232 serial port; it can be used even remotely trough a GSM modem.

Main options:

- edit/modify the operating parameters
- display OD in real time during measurements
- set up monitoring parameters
- download memory buffer with measured data
- modify the measuring sequence for any method.

## ZETALOG AND ZETACED

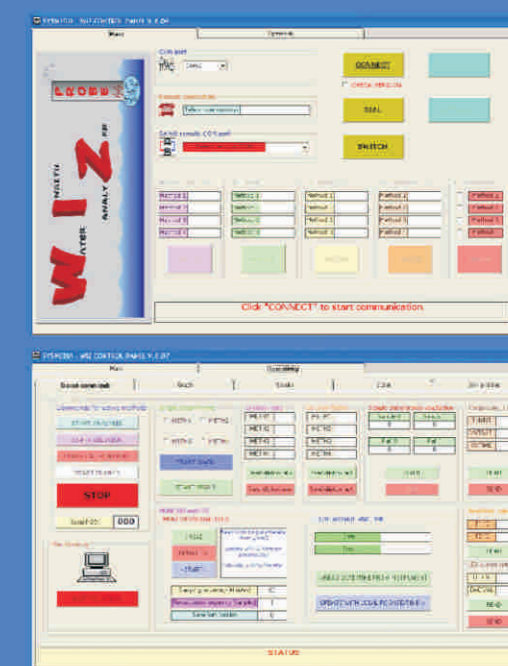
Zetalog and Zetaced are a unique package that allows to use WIZ at the higher level. Zetalog turn on WIZ just before the measurement cycle and turn it off as soon completed allowing power saving. Data are sent trough GPRS to Zetaced, running on a web server, where are logged and can be retrieved, validated and displayed as table or graphics trend.



ZETALOG 2.0



ZETACED GRAPH TREND



WIZ Control Panel

## UNIQUE METHODS

**-NH<sub>3</sub> OPA fluorimetric:** enhanced sensitivity ,single reagent, high stability, long term operations.

**-NO<sub>3</sub>+NO<sub>2</sub> Vanadium Chloride reduction:** long term operations, green method. no use of Cadmium or Hydrazine, high sensitivity for low level measurements

## STANDARD CONFIGURATIONS

- MP4 NUTRIENTS
- MP4 NUTRIENTS & SiO<sub>2</sub>
- MP5 NUTRIENTS (Requires datalogger control )
- MP3 NITROGEN
- MP4 PHOSPHOROUS
- MP3 PHOSPHORUS & AMMONIA
- MP4 ECO

NH<sub>3</sub>/NO<sub>2</sub>+NO<sub>3</sub>/NO<sub>2</sub>/PO<sub>4</sub>  
NH<sub>3</sub>/NO<sub>2</sub>+NO<sub>3</sub>/PO<sub>4</sub>/SiO<sub>2</sub>  
NH<sub>3</sub>/NO<sub>2</sub>+NO<sub>3</sub>/PO<sub>4</sub>/SiO<sub>2</sub>/NO<sub>2</sub>  
TN/NO<sub>2</sub>+NO<sub>3</sub>/NO<sub>2</sub>/NH<sub>3</sub>  
TP/P INORG./P ORGANIC/ORTHO-P  
TP/PO<sub>4</sub>/NH<sub>3</sub>  
TOC/COD/BOD/TURBIDITY

METHODS	CHEMISTRIES	Typical Range	MDL
NH3-N	OPA - FLUORIMETRIC EX/EM.:370/420÷ 470nm	0-500ppb	<1
BOD	TRYPTOPHAN LIKE, FLUORIMETRIC EX/EM 280/360nm	0-20...500mg/L	<1
TOC/COD	DIRECT READING AT 254NM, CORRECTION AT 550nm	0-50...200mg/L	<1
NO3-N Colo	VANADIUM CHLORIDE REDUCTION TO NO <sub>2</sub> , SAA+NED	0-1000ppb	<2
NO3-N UV	DIRECT READING AT 220nm, CORRECTION AT270nm	0-10mg/L	<0.3
NO2-N	SAA+NED	0-250ppb	<1
PO4-P	MOLYDBATE/ASCORBIC ACID	0-1000ppb	<2
SiO2	SILICOMOLYBDATE/ASCORBIC ACID	0-2000	<3
TP	HT DIGESTION, UV OXIDATION, MOLYDBATE/ASCORBIC	0-1000ppb	<3
TN	UV OXIDATION TO NO <sub>3</sub> , UV PHOTOREDUCTION TO N <sub>2</sub> , NED+SAA	0-5.0mg/L	<0.05
TN - UV	UV OXIDATION TO NO <sub>3</sub> , DIRECT READING AT 220nm	0-10mg/L	<0.3
TURB.	NEPHELOMETRIC AT 800nm	0-20....500NTU	<1

Technical Data	
Technology	µLFR* Technology, Batch, sequential for all MP versions
Applications	Hydrology/Water Resources/Coastal monitoring
Measurements frequency	Programmable
Cycle time	MP4 Nutrients, 40 minutes, for a complete cycle, other configurations from 40 to 60 minutes.
Samples preheating	Yes
Max number of reagents	8 reagents + QC check solution and Wash solution
Reagent stability	4-10 weeks, depending on the water temperature
Deployment time	Up to 2.5 months
Body material	PVC
Max depth	-10m
Operating temperature	4° - 40°C
Wastes	n. 1 x 5L bag for wastes containing reagents, free waste for washings with DI Water & Sample
Flow cell type	Quartz 4 measuring sides: 10mm x 2.5mm
Detectors	<ul style="list-style-type: none"> <li>- Standard Colorimetric methods: multi-beam fiber optic colorimeter with silicon detector</li> <li>- Fluorimetric methods: LED/filters: Ex./Em. at specific wavelength</li> <li>- Turbidimetric: scattering at 800nm</li> <li>- COD UV: LED 254nm corrected at 525nm</li> <li>- TN/NO3 UV: Xenon flash lamp, filters 220 and 270nm</li> </ul>
Detector technology	LED/LED UV/UV filters
Reading methods	Absorbance/Fluorimetry/UV/Nephelometry
Reduction Module for NO3	Yes by UV photoreduction
WIZ Control Panel Software	Compatible with Windows XP, 7.0 & 8.0, WIZ setup and operations, data download to PC,
QC solution	Concentrated for long term stability, diluted on line when required
Off scale sample dilution and reanalyze	Yes
Automated sample spike	Yes
Calibration	Automated after reagent replacement
Power supply	12VDC
Power requirements	3W in Stand By, 8W (average) during analysis, max 1.5A; MP4 standard 0.46Ah
Dimensions	Analytical unit: 140mm (diameter) x 535mm (height) Reagent canister (standard): 70mm (diameter) x 230mm (height)
Connector	Submersible male 6 poles for RS232 and 12VDC power
Cable	Submersible Standard length 10m female connector
Data output	RS232
Filtration options:	10/25/100/400uM with or w/o self cleaning, 0.25uM self purging microfilter
Standard package:	<ul style="list-style-type: none"> <li>- WIZ probe</li> <li>- Reagents canister standard (Enlarged version on request)</li> <li>- 12 VDC power supply for maintenance and setup</li> <li>- Reagent bag filling tool</li> <li>- 10 m submersible cable</li> <li>- Carrying case</li> <li>- Wiz control panel software license</li> <li>- Start-up kit</li> </ul>
Options	<ul style="list-style-type: none"> <li>- Customized cable length</li> <li>- Enlarged Reagent Canister</li> <li>- Zetalog</li> <li>- Zetaced setup and license</li> </ul>

Subject to change without notice



# EASYCHEM TOX On-Line

DISCRETE ANALYZER FOR THE COMBINED MEASUREMENT OF ACUTE TOXICITY AND CHEMICAL PARAMETERS IN WATER

As a result of years of intensive research and development activities, Easychem TOX on-line is an original direct reading multi-parametric analyzer based on discrete analysis technology, for fully automated toxicity measurements of water samples using live cultures of luminescent bacteria, combined with the quantitative measurement of chemical parameters applying standard spectrophotometric / fluorimetric methods.



# EASYCHEM TOX On-line

## DISCRETE ANALYZER FOR THE COMBINED MEASUREMENT OF ACUTE TOXICITY AND CHEMICAL PARAMETERS IN WATER

EASYCHEM TOX on-line is a discrete automated platform equipped with color touchscreen LCD and housed in an industrial cabinet, comprising two refrigerated compartments, one for bacteria and the other for reagents, calibrants and controls. A mechanical arm for aspiration, transferring and dispensing of reagents and samples and a thermostated reaction plate with 80 positions are incorporated with a luminometer, a spectrophotometer and/or a fluorometer, integrated with an automated cuvette washing station.



### MULTIPARAMETRIC ON-LINE ANALYSIS OF CHEMICAL PARAMETERS

With regard to the spectrophotometric analysis, the on-line analyzer can be configured to automatically measure up to 10 chemical parameters (15 without toxicity), using standard methods and including complex procedures such as the determination of total phosphorus and/or total cyanides, which are performed by means of multichannel external pretreatment modules, complete with a filtration system.

### SEVERAL DATA INTERFACE AVAILABLE AS STANDARD

EASYCHEM TOX on-line provides local data storage via serial RS-232 with separate analog outputs 4-20 mA, remote data storage on a web server and data transmission via ftp, http and SMS. An immediate alert service is available in case of detected non compliances. Finally, the management software allows the integration of different instrumentation, thus realizing a truly integrated monitoring station, combining chemical and toxicological on-line control of water samples.

### DIRECT READ: MORE SIMPLICITY & SECURITY

Easychem TOX on-line utilizes direct read luminometer utilizing a true discrete, direct read measurement system and reusable, high purity synthetic optical cuvette system eliminating compromised sample measurement.

### SMARTWASH: ELIMINATE CARRYOVER DURING SAMPLING

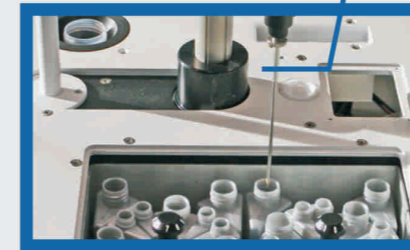
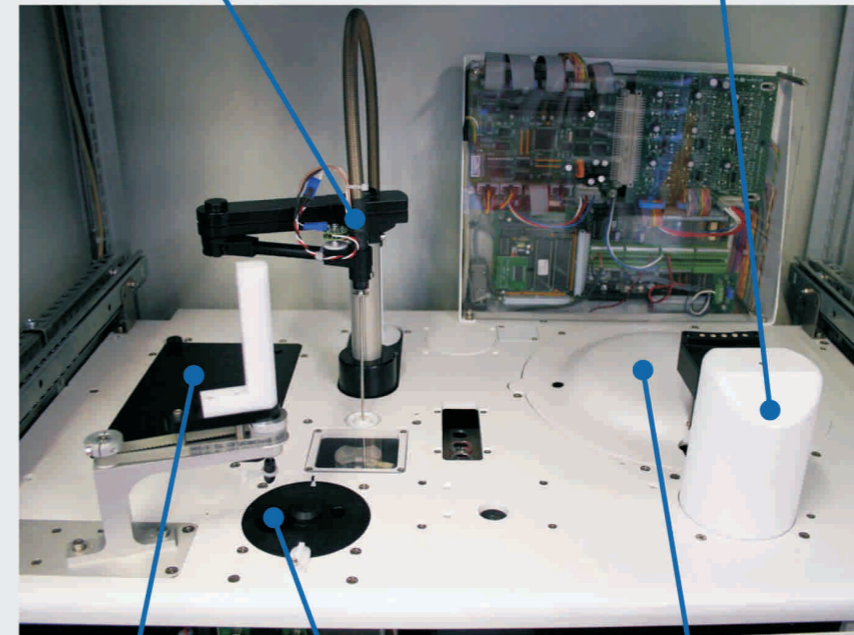
- Level sensor makes probe washing easy, with a standard 2 mm immersion depth
- Probe cleaned after every liquid contact - prevents cross contamination and carryover
- Potential contaminants go the way they need to flow – out of the sample probe!
- Three stage process: clean the inside of the probe, clean the washing well, then clean the outside

### FULLY AUTOMATED FOR UNATTENDED TOXICITY MONITORING

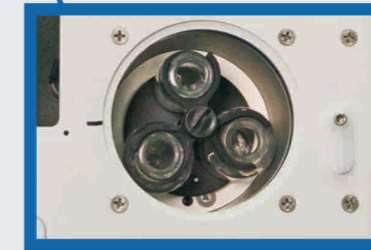
Timing and frequency of analytical cycles, limits and parameters of quality controls are programmable by the operator and managed automatically. The continuous measurement of blanks and samples at pre-defined time intervals of about 40 seconds, results in the generation of inhibition kinetics, which allow to achieve, from the very beginning of the analysis, preliminary information on the level of sample contamination. Following a toxicity alert, the system is able to react immediately by automatically replicating samples and performing control checks to confirm identified toxicity, significantly reducing the occurrence of false positives.

Micro pipettor-dilutor

Washing station Smartwash



On-board reagents (up to 36 reagents)



Refrigerated compartment for 3 vials of Lyophilized Bacteria



Long-life cuvettes with integrated

### SAMPLE LOADING

- Five separated sample inputs, to be connected to external sample pretreatment units according to the required tests and water sample matrix to be measured (homogenizer, 25 microns filtration, 0.2 microns filtration, UV/HT digester, distillator)

### CUVETTE QUALITY ASSURANCE SYSTEM: ELIMINATE CARRYOVER DURING ANALYSIS

- Automated cleaning eliminates carryover in the cuvette
- Optical integrity of each cuvette quantitatively verified before each use
- Provides an infinite number of reaction vessels for analysis
- Economical: long lasting cuvettes
- Environmentally friendly: minimize hazardous waste and solid wastes
- No operator intervention required!

### LUMINOMETER

- High resolution, digital photon counter
- Low dark current

### COMPUTER CONTROLLED MICROPIPETTOR

- Accurate and precise dispensing of all liquids
- Automatic probe washing between each sampling cycle
- Microlitre reagent and sample consumption
- Liquid level sensor provides warnings for low reagent and sample levels

### USER FRIENDLY SMARTSTART SOFTWARE



The Easychem TOX on-line operating software runs under Windows XP or Windows Vista. Its bright graphical user interface simplifies routine work and offers the operator a concise guide through the operating functions.

Sample analysis

- Up to 10 different dilutions programmable per sample.
- Up to 4 different dilutions programmable per test.
- All measurements of blanks and samples at the different dilutions performed in duplicate.
- Real time calculation of all parameters required by UNI EN ISO 11348-3 - Determination of the inhibitory effect of water samples on the light emission of *Vibrio fischeri* (Luminescent bacteria test) - Part 3: Method using freeze-dried bacteria.
- Inhibition of light emission at 5, 15 and 30 minutes.
- Deviation from mean of blank duplicates.
- Deviation from mean of parallel determinations of sample inhibition values.
- Stability of blank curves.
- Graph showing kinetic curves representing light emission measurements of blank and samples every 30 - 40 seconds. All measurements values enclosed in a table.
- Graph showing kinetic curves representing mean light emission measurements of blank and sample duplicates every 30 - 40 seconds. All mean measurements values enclosed in a table.
- Graph showing kinetic curves representing mean light emission inhibition measurements of sample duplicates every 30 - 40 seconds. All mean light emission inhibition measurement values enclosed in a table.

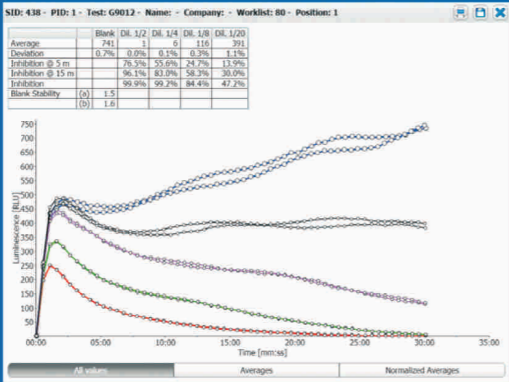


Fig.1. Example of a sample analysis performed at four different dilutions (1/2, 1/4, 1/8, 1/20)

Control analysis

- The analyzer is programmed to perform inhibition test of any of the three positive controls required by UNI EN ISO 11348-3, 2.2 ppm zinc (II), 3.4 ppm 3,5-dichlorophenol and 18.7 ppm chromium (VI).
- All measurements of blanks and controls at the required concentration performed in duplicate.

MONITOR SCREEN

- Real-time presentation of sample and reagent status
- Dynamic monitoring of test execution
- Analyzer temperature control, START, STOP, and PAUSE functions

METHODOLOGY PROGRAMMING

- All method parameters are completely user programmable
- All settings are user programmable
- User defined instrument factors
- User selectable dilution ratio
- User selectable samples re-run option
- Tests calculation models are user selectable

GRAPH SCREEN

- Display of test reaction curves
- Display of positive controls

DIAGNOSTIC SOFTWARE

- Each instrument part can be singularly tested
- Remote diagnostic capability

MORE FEATURES

- Multilanguage files (user programmable)
- Bi-directional communication compliant with LIMS standard
- Traceability and lot management

READY TO USE REAGENTS



- Developed specifically for the EASYCHEM analyzers
- Save time
- Save money
- A full range of reagents for Environmental analysis
- Simple
- Complete range adapted to all parameters
- Ready to use



**We have created Selection**, a full range biological assay and reagents dedicated to Easychem discrete analyzers.

Developed, tested and validated by our application laboratory, they will guarantee a perfect stability and reproducibility of your analyses.

Easy to use, they are supplied liquid or lyophilized, in specific bottles directly positionable Easychem.

Thus, this ready solution greatly simplifies the preparation of your analysis, facilitates the use and storage of reagents. It also secures your analyzes with reagents adapted

REAGENTS FOR ACUTE TOXICITY

- Rehydration buffer
- Reagent A (bacteria)
- Acute test buffer
- Control Zn (II)
- Control DCP
- Control Cr (VI)



MAIN PARAMETERS

Acute Toxicity Test

Acute toxicity test evaluates the effects on living organisms, generated by toxic substances contained in the sample, thus providing an early warning. The most common toxicants, among the thousands that can be present in the samples, are the following :

- BIOTOXINS
- HEAVY METALS
- HERBICIDES
- OIL CONTAMINANTS
- PCBs
- PESTICIDES
- POLYCYCLIC AROMATIC HYDROCARBONS (PAHS)
- ...

Chemical Parameters

Basic methods

- ALKALINITY
- ALUMINIUM
- AMMONIA (COLORIMETRIC)
- AMMONIA (FLUORIMETRIC)
- BORON
- CADMIUM DISSOLVED
- CALCIUM
- CHLORIDE
- CHLORINE
- CHLORINE TOTAL & FREE
- CHROMIUM 6+
- COD (UV DIRECT READING)
- COLOR
- COPPER
- CYANIDE INDEX
- ETHYLENE GLICOL
- HARDNESS
- HYDRAZINE
- IRON TOTAL DISSOLVED
- LEAD DISSOLVED
- MANGANESE
- MERCURY
- MONOCHLORAMMINE
- NICKEL
- NITRATE (HYDRAZINE REDUCTION)
- NITRITE
- PHENOL INDEX
- PHOSPHATE
- SILICATES
- SULFATE
- SULFIDE
- ZINC

Methods requiring sample digestion

- CADMIUM TOTAL
- CHROMIUM TOTAL
- COPPER TOTAL
- IRON TOTAL
- LEAD TOTAL
- MANGANESE TOTAL
- NICKEL TOTAL
- NITROGEN TOTAL
- PHOSPHORUS TOTAL
- ZINC TOTAL

Methods requiring distillation and/or special digestion

- CYANIDE FREE
- CYANIDE TOTAL
- PHENOL VOLATILE

# TECHNICAL SPECIFICATIONS

DESCRIPTION	Fully automated, direct read, on-line Discrete analyzer
LUMINOMETER	Photomultiplier tube
PHOTOMETER	Multi-wavelength optics, dual beam, direct reading
MEASUREMENT TYPE	Cyclic
MEASURING INTERVAL	Programmable
TOXICITY KIT	Freezed dried luminescent bacteria, assay buffers and positive controls
COLORIMETRIC KITS	industrially prepared and certified after production
MEASURING TIME	15 minutes (toxicity), chemical parameters according to the specific methods
ON-BOARD REAGENTS	up to 36 reagents can be loaded into the refrigerated compartment in n.2 removable racks with n.16 positions each (20 ml containers) and n.4 extra position for 50 ml containers
ANALOG OUTPUTS	n.8 4-20 mA, expandable, RS-232, optional GSM/GPRS
INPUT SIGNALS	n.8 digital inputs, expandable and configurable
OUTPUTS AND ALARMS	n.8 digital outputs, expandable and configurable, potential free contacts
SAMPLE DELIVERY	n.5 sample wells with overflow updated by internal pumps
SAMPLE TEMPERATURE	8 - 35 °C
REAGENTS AND SOLUTIONS REPLACEMENT	typical 4 weeks
PROTECTION	IP55
HARDWARE	Industrial microcontroller, PC panel with touchscreen graphic display
POWER SUPPLY	24 Vdc, external power supply included; 45 W (mean)
WEIGHT	100 Kg without reagents
DIMENSION	160 (H) x 80 (W) x 50 (D) cm

ANALYZERS RANGE

THE AMS SYSTEMA DISCRETE ACUTE TOXICITY RANGE



Easychem TOX for Laboratory  
(30-min acute toxicity)  
Up to 45 tests/hour



Easychem TOX On-Line