

# SMARTCHEM 200

STATE-OF-THE-ART DIRECT READ  
DISCRETE ANALYZER FOR  
AUTOMATED CHEMISTRIES



# SMARTCHEM 200

FULLY AUTOMATED, DIRECT READ, DISCRETE ANALYZER TO MAXIMIZE PRODUCTIVITY FOR ROUTINE AND SPECIAL CHEMISTRIES, UP TO **200 TESTS/HOUR**



The Smartchem 200 combines the latest technology in discrete analysis with an innovative, unique design that guarantees accurate and reproducible results.

The Smartchem 200 is the first discrete analyzer to utilize the Cuvette Quality Assurance System, performing an integrated QC check of each cuvette prior to use. In addition to automated analysis the Smartchem 200 offers automated system Quality Control.

The Smartchem 200 is also the first discrete analyzer to utilize a patented, dedicated sample prep module for the determination of NO<sub>x</sub> by Cadmium reduction. Designed for multi-tasking and high throughput rates, the NO<sub>x</sub> module also provides automated cadmium regeneration.

Now, the instrument provides also a pH, Conductivity and Redox module.

## INTERACTIVE GRAPHICAL "DASHBOARD" PROVIDES A USER-FRIENDLY INTERFACE:

1. SELECT METHOD(S) AND TYPE IN SAMPLE IDS
2. FOLLOW THE DASHBOARD AND PLACE THE SAMPLES, REAGENTS, AND STOCK STANDARD IN THE AUTOSAMPLER  
START ANALYSIS WITH A SIMPLE CLICK, ALL ANALYTICAL PROCEDURES FROM WORKING STANDARD DILUTION TO SAMPLE ANALYSIS, CUVETTE WASHING AND SYSTEM QC, ARE FULLY AUTOMATED AND DO NOT NEED ANY OPERATOR ACTION
- 3.

## THE ADVANTAGES OF DIRECT READ DISCRETE ANALYSIS

- Each reaction takes place in its own optical cuvette
- True sample blanking performed directly in each cuvette
- No flow cells
- No baseline stabilization
- No manual manifold changeover
- No excessive reagent consumption
- Automatic reagent blanking to evaluate reagent quality
- Pre and Post dilution of samples and calibration standards
- Automatic spike preparation
- Automatic method changeover
- Analyze samples in "batch" mode or "random" mode

## DIRECT READ : MORE SIMPLICITY & SECURITY

The Smartchem 200 utilizes direct read photometry 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 2mm 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 of the probe

## SAMPLE LOADING

- 5 universal, separate racks for continuous loading of samples, calibrators and controls
- Up to 200 tests/hour including ISE

## FILTER WHEEL

- 12 optical filters (9 on board), plus 1 dark filter, ranging from 340nm to 880 nm
- Others filters optionally available

Micro pipettor-dilutor

Washing station Smartwash

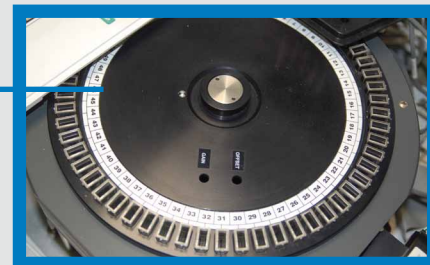
Cadmium module for Nitrate analysis and/or



ISE module for pH, conductivity and redox analysis



On-board reagents



Long-life cuvettes with integrated Cuvette Quality Assurance System

## 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!

## COMPUTER CONTROLLED MICRO PIPETTOR

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

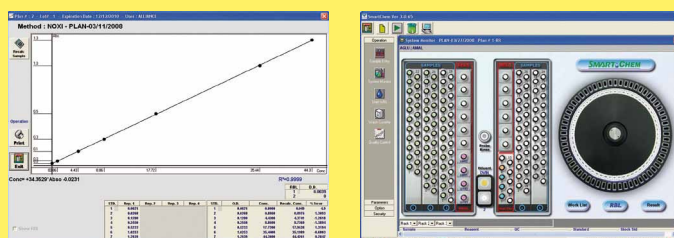
## NITRATE/NITRITE OR ISE MODULE

- Automated cadmium coil regeneration for Nitrate & Nitrite analysis, complies with US EPA Method # 353.2 and SM 4500-NO3-F
- ISE (Ion Selective Electrodes) module for pH, conductivity and redox analysis
- You can choose between each module or both

## PHOTOMETER

- High resolution, dual beam digital detector
- Expanded absorbance range to 2.500 ABS
- 5 detection modes: endpoint, fixed time, differential, bichromatic, and kinetic

## USER FRIENDLY SMARTSTART SOFTWARE



The Smartchem 200 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.

## MONITOR SCREEN

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

# MAIN PARAMETERS

## Surface, ground, drinking, waste and sea water

- Acidity
- Alkalinity\*
- Aluminum
- Ammonia\*
- Chemical Oxygen Demand (COD)\*
- Chloride\*
- Chlorine
- Chromium\*
- Cyanide\*
- Fluoride\*
- Hardness\*
- Iron
- Manganese
- Nitrate\*
- Nitrite\*
- Phenol\*
- Phosphate\*
- Phosphorous\*
- Silicate\*
- Sulfate\*
- Total Kjeldahl Nitrogen\*
- Total Kjeldahl
- Urea

\* According to EPA, ISO approved Methods

## Wine

- Acetic acid
- Ammonia
- Ascorbic Acid
- Copper
- Ethanol (TVA)
- Free SO<sub>2</sub>
- Fructose
- Gluconic acid
- Glucose
- Iron
- Malic acid
- OD 420, OD 520, OD 620
- PANOPA
- pH
- Sorbic Acid
- Sucrose
- Tartaric acid
- Total acidity
- Total SO<sub>2</sub>

## Soils & Plants

- Ammonia
- Boron
- Calcium
- Chloride
- Lysine
- Magnesium
- Nitrate
- Nitrite
- Phosphate
- Total Nitrogen
- Total Phosphorous
- Urea

## Feeds & Fertilizers

- Ammonia
- Calcium
- Chloride
- Phosphate
- Protein
- Total Nitrogen
- Total Phosphorous
- Urea

## METHODOLOGY PROGRAMMING

- All parameters are completely user programmable
- Up to 999 methods can be memorized
- All settings are user programmable
- User defined instrument factors
- User selectable pre-dilution and re-dilution ratio
- User selectable samples re-run option
- Tests calculation models are user selectable: Factor, Standard, Linear Fit, Point to Point, Quadratic, Cubic, Quartic, Cubic Inv., Sp-line, Log-Logic, Exponential, Log-Log Cubic

## AUTOMATIC DETECTION OF:

- End point limit
- Substrate depletion
- Fixed time and kinetic reaction linearity

## GRAPH SCREEN

- Display of test reaction curves
- Display of test calibration curves

## 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 SMARTCHEM and EASYCHEM analyzers
- A full range of reagents for Environmental and Wine analysis
- Complete range adapted to all parameters
- Save time
- Save money
- Simple
- Ready to use



**We have created Selection**, a full range of enzymatic and colorimetric reagents dedicated to discrete analyzers Smartchem and Easychem. Developed, tested and validated by our application laboratory, they will guarantee a perfect stability and reproducibility of your analyses. Very easy to use, they are supplied liquid, in specific bottles directly positionable on Smartchem and Easychem, and automatically detected by the bar code reader

(in option). Thus, this ready solution greatly simplifies the preparation of your analysis, facilitates the use and storage of reagents. It also secures yours analyzes with reagents adapted to your application and your instrument.

| REAGENTS FOR ENVIRONMENTAL ANALYSIS   | REAGENTS FOR WINE ANALYSIS   |
|---|--|
| <b>Selection</b><br>AQUA  | <b>Selection</b><br>OENO   |
| <ul style="list-style-type: none"> <li>Alkalinity</li> <li>Ammonia</li> <li>Chromium VI</li> <li>Chlorides</li> <li>Cyanides</li> <li>Nitrate</li> <li>Nitrite</li> <li>Phosphates</li> <li>Silicate</li> <li>Sulfates</li> <li>Phenol index</li> <li>Total Kjeldahl Nitrogen</li> <li>Total Phosphorous</li> </ul> | <ul style="list-style-type: none"> <li>Acetic, Citric, Gluconic, Lactic, Malic and Tartric Acid</li> <li>Alpha Amino Nitrogen</li> <li>Ammonia</li> <li>Anthocyanin</li> <li>Arginine</li> <li>Copper</li> <li>Fructose</li> <li>Free SO2</li> <li>Glucose</li> <li>Glycerol</li> <li>Iron</li> <li>Polyphenols</li> <li>Total Acidity</li> <li>Total SO2</li> <li>Urea</li> </ul> |

*Other parameters on demand.*

*Kits supplied in liquid format in vials adapted to your Smartchem or Easychem.*

*1 to 3 reagents necessary according the parameter.*

## THE AMS SYSTEMA DISCRETE ANALYZERS RANGE



**Smartchem 140**  
Up to 140 tests/hour



**Smartchem 170**  
Up to 170 tests/hour





**Smartchem 200**  
Up to 200 tests/hour



**Easychem 300**  
Up to 300 tests/hour

# TECHNICAL SPECIFICATIONS

|                         |   |  |
|-------------------------|---|--|
| DESCRIPTION             | Fully automated, direct read, bench top, Discrete analyzer  |  |
| ASSAY TYPE              | End Point, Kinetic, Differential, Bi chromatic assays   |  |
| ON-BOARD REAGENTS       | 2 racks provided to contain up to 16 reagents as follow:<br>- 1 rack for 10 reagent position<br>- 1 rack for 6 reagent positions and 10 stock standards<br>- 2 dedicated positions for diluents and other (spike solutions, QC samples...)  |  |
| SAMPLES LOADING         | 5 racks for continuous loading of samples (126 positions)   |  |
| URGENT SAMPLE ANALYSIS  | Allowed at any time   |  |
| THROUGHPUT              | Up to 200 tests/hour  |  |
| READING SYSTEM          | Direct photometry   |  |
| MINIMUM REACTION VOLUME | 300 µl  |  |
| OPTICS SYSTEM           | <b>Photometer</b>   | multi - wavelength optics, double beam   |
|                         | <b>Wavelength</b>   | 12 narrow band interferential filters (9 on board)                                   |
|                         | <b>Source</b>   | halogen lamp 6V/10W  |
|                         | <b>Optical Path</b>   | 10 mm  |
|                         | <b>Linear range</b>   | 0.001 - 2.500 Abs  |
|                         | <b>Resolution</b>   | 0.0001 Abs   |
| SAMPLING SYSTEM         | One mechanic arm provides all sampling operation with :<br>- Capacitive liquid level sensing<br>- Reagent pre-warming at 37°C<br>- Automatic probe washing<br>- Sample Volume range : 3.0 - 300 µl (1µl incr.)<br>- Reagent Volume : 3.0 - 300 µl (1µl incr.)<br>- Sample pre-dilution<br>- Sample rerun with or without dilution |  |
| DILUTOR                 | Automatic dilution in pre and post-dilution   |  |
| REACTION PLATE          | Circular 60 semi-disposable cuvettes tray:<br>- Automatic cuvette washing<br>- Continuous monitoring of cuvette quality<br>- Incubation temperature: 37°C   |  |
| DIMENSIONS              | 42 x 65 x 100 cm (H x W x L)  |  |
| WEIGHT                  | 65 Kg   |  |
| OPTIONAL ACCESSORIES    | - Bar code reader<br>- ISE detector   | - Nitrate module<br>- Peltier chiller for reagent module                             |
| COMPLEMENTARY PRODUCTS  | Digestion system: Easy digest      Distillation system: Easy Dist      Ready to use reagents  |  |
|                         |    |  |

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www.ams-systea.com

**Systea S.p.A.**  
Via Paduni, 2A  
03012 Anagni  
ITALY

Tel. : (+39) 0775 776 058  
Fax. : (+39) 0775 772 204

**AMS France**  
10 avenue Charles de Gaulle  
95740 Frepillon  
FRANCE

Tel. : (+33) 134 18 71 10  
Fax : (+33) 139 60 72 39