

PATENT PENDING

# SMART<sub>2</sub>CHEM™

YOUR PERSONAL CHEMIST



 **WESTCO**

*Scientific Instruments, Inc.*

*Setting the Standard  
for the Future*

## introduces DISCRETE analysis

- Each reaction in its own cuvette • TRUE sample blanking
- NO flowing streams • NO pump tubes • NO baseline stabilization • NO shutdown • NO hardware changes
- Minimize hazardous waste • Use only volumes the method requires

### SmartStart Software

- Ready to run with one click
- TRUE unattended operation, including after hours
- Unlimited number of methods, ready to be run at any time
- Automated method changeovers
- Automatic standards preparation
- Automatic dilutions
- Automatic spikes

### Computer controlled micro pipettor

- Precise dispensing of all liquids
- Probe cleaning after every liquid contact prevents cross contamination and carryover
- Reduction of reagents and hazardous wastes
- An integral sensor for low level alerts

### Wash station

- Automatic cuvette cleaning provides continuous operation
- Reduce operating costs
- Optical integrity of each cuvette is verified before each use

### Continuous sample loading

- Sample racks may be exchanged without interrupting the analysis

### Reaction Plate

- Accurately maintains temperature +/- 0.1°C

### Photometer

- A high resolution, dual beam digital detector
- Expanded absorbance range to 2.500 AUFS reduces the need to reanalyze over range samples
- 5 detection modes: endpoint, fixed time, differential, bichromatic, and kinetic

### Filter wheel

- 9 optical filters, ranging from 460 to 880 nm with others optionally available

### Options

- ISE detector
- Bar code reader

## YOUR PERSONAL CHEMIST PERFORMS ANY MANUAL OR AUTOMATED METHOD:

- Environmental ■ Chemical ■ Agricultural
- Food ■ Pharmaceutical

USEPA - ASTM - AOAC - DIN - ISO

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## AUTOMATION WITHOUT COMPROMISE

Today's increased emphasis on environmental quality has given new importance to water, seawater, and soil testing. While the first priority must be accuracy, reducing costs and increasing efficiency are also important. Until now, it wasn't possible to achieve all three.

Years ago, chemists developed the analytical methods that are still in use today. With good technique, these manual analyses would yield high accuracy, but these tests were very labor intensive. Often, time and cost constraints led to compromises.

Out of the need to reduce costs and improve consistency, automation was born.

As Continuous Flow Analysis (CFA) developed, it did indeed improve productivity and consistency. Unfortunately, the cost of additional hardware, along with lengthy set-up and shut-down times made CFA impractical for small runs. Carryover and hydraulic noise complicated analyses. And still, operator technique played a crucial role in the quality of the data. Overall data quality improved, but there were still many compromises.

Finally, SMARTCHEM™ eliminates the compromises! SMARTCHEM performs assays exactly as a chemist without time constraints would, but with the precision that only automation can bring!

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## WHO GETS THE BEST RESULTS?



***All of Them!***

That's right. With SMARTCHEM, they all get the same results. SMARTCHEM takes the operator variability out of the analysis. After loading the samples and reagents, the user's only role is to click "Start". How can there be any variability in that? No more bubble patterns, baselines, pump tubes or carryover means that a first time user will get the same results as a technician that has been running SMARTCHEM for years.

# SMARTCHEM™

YOUR PERSONAL CHEMIST



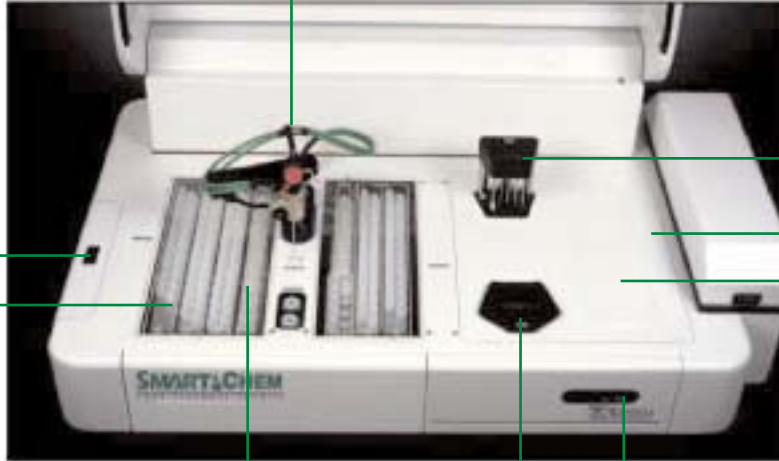
**Sample Arm:** High precision pipettor and diluter with integral level sensor



**Wash Station:** A high performance cleaning station for continuous operation

**Ion Selective Electrode (ISE):** Optional ISE for pH, Nitrate, Ammonia, Chloride, Fluoride

**Sample Racks:** 5 individual racks hold 126 samples and allow for continuous loading



**Digital Detector:** Dual Beam, Wide Range

**Filter Wheel:** Contains 1 dark and 9 optical filters



**Reagent Rack:** Holds up to 16 reagents

**Reaction Plate:** Contains 60 cuvettes and maintains temperature to +/- 0.1 degree C

**Standby Mode:** Ensures quick startup while extending lamp life



## SMARTCHEM, YOUR PERSONAL CHEMIST, GIVES YOU UNIFORM HIGH-QUALITY DATA AT TOP SPEED AND LOW COST

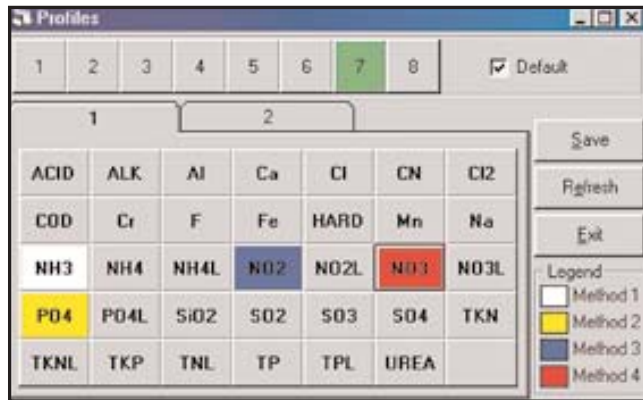
SMARTCHEM utilizes the very same techniques you would to perform a manual assay. Computer-controlled robotics and precise, millisecond timing allow it all to take place at up to 180 tests per hour, and assure the highest possible data quality in the process. The compromises “necessary” for automated chemical analysis are now a thing of the past:

- To maximize precision, you wouldn't measure your samples and reagents with a peristaltic pump and flexible tubing; you'd use a pipette. SMARTCHEM utilizes a computer-controlled micro-pipettor for the ultimate dosing accuracy.
- To prevent noise, you wouldn't try to read the absorbance of a moving stream of liquid and guess at its peak absorbance; you'd carefully stabilize a cuvette in your detector and take its reading, just as SMARTCHEM does.
- To eliminate carryover, you wouldn't mix all of your samples and reagents in the same vessel without cleaning it between them. You'd use a discrete cuvette for each sample and then meticulously clean it for reuse, exactly like SMARTCHEM does.
- To utilize a “sample blank”, you wouldn't read the absorbance of a different (hopefully similar) aliquot; good laboratory technique dictates that you would read the cuvette that contains your sample before adding the final reagent. Of course, this is how SMARTCHEM works.

And on and on. Once you've loaded your samples, entered your worktable, and clicked “Start”, you can TRULY walk away and tend to the other laboratory tasks that require your attention, confident in the quality of the data that you and SMARTCHEM are generating!



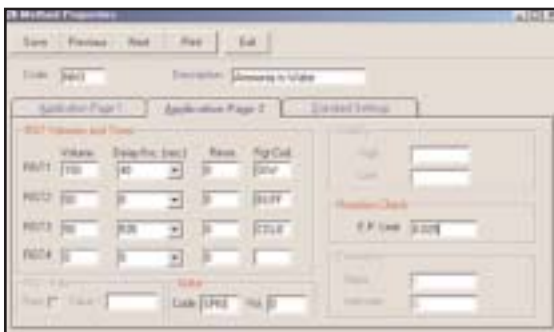
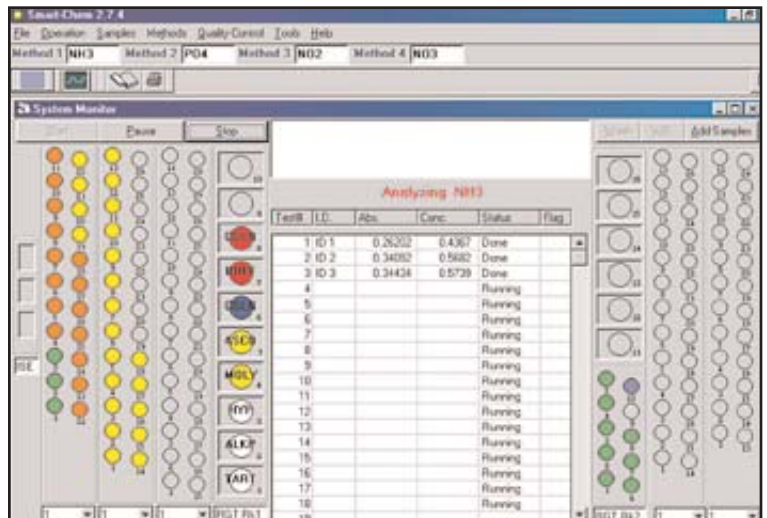
# SIMPLE AND FLEXIBLE SOFTWARE POWERS THE SMARTCHEM



True Sample Blanking with a click of the mouse

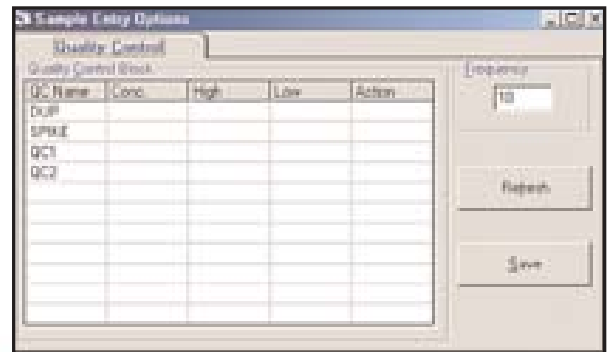
Choose the methods to run by clicking the mouse. All test criteria are set in place

Enter the number of samples and SMARTCHEM can take over from there



The System Monitor continuously updates and displays all phases of operation. Reagent positions are color-coded for easy identification, and sample positions change color to indicate their status

The Method is defined by the software settings, not by hardware such as pump tubes, coils, and sample injection loops



Simple QC Block makes quality control a snap. Enter any QC sample as well as Spikes and Duplicates



## Specifications

Size (HxDxL)	42x65x100 cm (16.5x25.5x39.5 in)
Weight	65 Kg (137 lbs)
Ambient temperature	18 - 30°C
Relative humidity	20% to 85% noncondensing
Sample capacity	126 sample cups with continuous loading
Reagent capacity	16 positions, 40-mL bottles
Reaction temperature	Adjustable, 30 - 45°C
Reaction cuvettes	60 semi-disposable cuvettes, 1 cm pathlength
Detector	Dual-beam photometer with 20-bit resolution
Filter wheel	10 filters: dark, 460, 480, 510, 520, 550, 570, 630, 660, 880
Linear range	0.0001 to 2.500 AUFS
Resolution	0.0001 AUFS
Lamp	6V/10W halogen lamp
Sample blanking	User-selectable
AutoDilution	Up to 100x
Low reagent alarm	Yes
Low sample alarm	Yes
Standby mode	Yes
Sampling rate	Up to 180 tests/hour
Sample consumption	3 - 300 µL
Reagent consumption	3 - 300 µL
Power	90-250 VAC, 47-63 Hz, 300W

## Computer Requirements

Dedicated IBM PC-compatible  
700 MHz or better  
10 GB Hard Disk or better  
64 MB RAM or better  
15" VGA monitor capable of  
800 x 600 resolution  
Floppy drive and CD-ROM drive  
Inkjet or laser printer  
Windows 95/98/2000/XP  
Available 9 pin RS232 serial port



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