



San⁺⁺

continuous flow analyzer



Skalar

your partner in chemistry automation

Automated Wet Chemistry Analysis



The modular concept of the Skalar San++ analyzers allows them to be configured to meet the requirements of today's laboratory.

State of the art detection, supported by the latest in software development, combines perfectly to make the analyzer the most sophisticated, but easy to use, fully automated system available.

The San++ system incorporates the latest technologies, making it the most reliable continuous flow analyzer and the world leader in automated wet chemistry analysis. The San++ provides an extended range of auto samplers. Based on sample workload a sampler can be selected that fits the need for each individual laboratory.

Depending on the application a throughput between 20 and 140 analyses per hour can easily be achieved, resulting in the most accurate and cost effective means of analyzing the largest range of sample types. Daily workloads of 800 samples and more are easily automated, analyzing up to 16 parameters per sample simultaneously.

The chemistries can be configured with automatic sample preparation features such as in-line dialysis, digestion and distillation for complex applications, providing the operator a high level of automation and more convenience of operation.

All Skalar systems are designed and manufactured according stringent quality control conditions in an ISO 9001 environment. The flow analysis technology used in the Skalar San++ is the most proven and reliable technology available for automated wet chemistry analysis.



Applications

Over the years Skalar has been working and developing applications for a variety of industries. Our comprehensive applications library provides a large selection of documentation and standardization references.

Skalar applications are approved and/or conforming methods by regulatory agencies such as ISO, EPA, Standard Methods, EBC, ASBC, AOAC, Coresta and others. Each method has been successfully integrated into many production processes and quality assurance departments.



Water

The San⁺⁺ is widely used for environmental analysis, such as surface water, ground water, wastewater, drinking water and seawater. Laboratories processing hundreds of samples per day have successfully integrated the analyzer for nutrients, such as Ammonia, Nitrate, Nitrite and Phosphate. In-line digestion and/or in-line distillation is available for complex Total Phosphate, Total Nitrogen, Total Cyanide and Total Phenol analysis.



Soil, Plant and Fertilizer

Soil and Plant analysis is performed by many laboratories worldwide. Ammonia, Nitrate, Phosphate, Potassium, Total Nitrogen, Total Phosphorus and Urea are commonly analyzed parameters and these can accurately be automated on the San⁺⁺ analyzer. The San⁺⁺ has proven to provide the high accuracy required for fertilizer production and also assures fast turnaround times, allowing an immediate control of the process.



Beer and Malt

Skalar offers full automation for various parameters in the analysis of Beer and Malt. Applications such as Bitterness, β -Glucan, Total Sulfur Dioxide, and Free Amino Nitrogen in beer, as well as the enzyme determinations in malt, such as Diastatic Power and Alpha Amylase are all easily automated. This results in a higher sample throughput with reduced analysis time. A faster and more accurate quality control feedback provides optimum production control which helps to assure a high quality of the raw and final product.

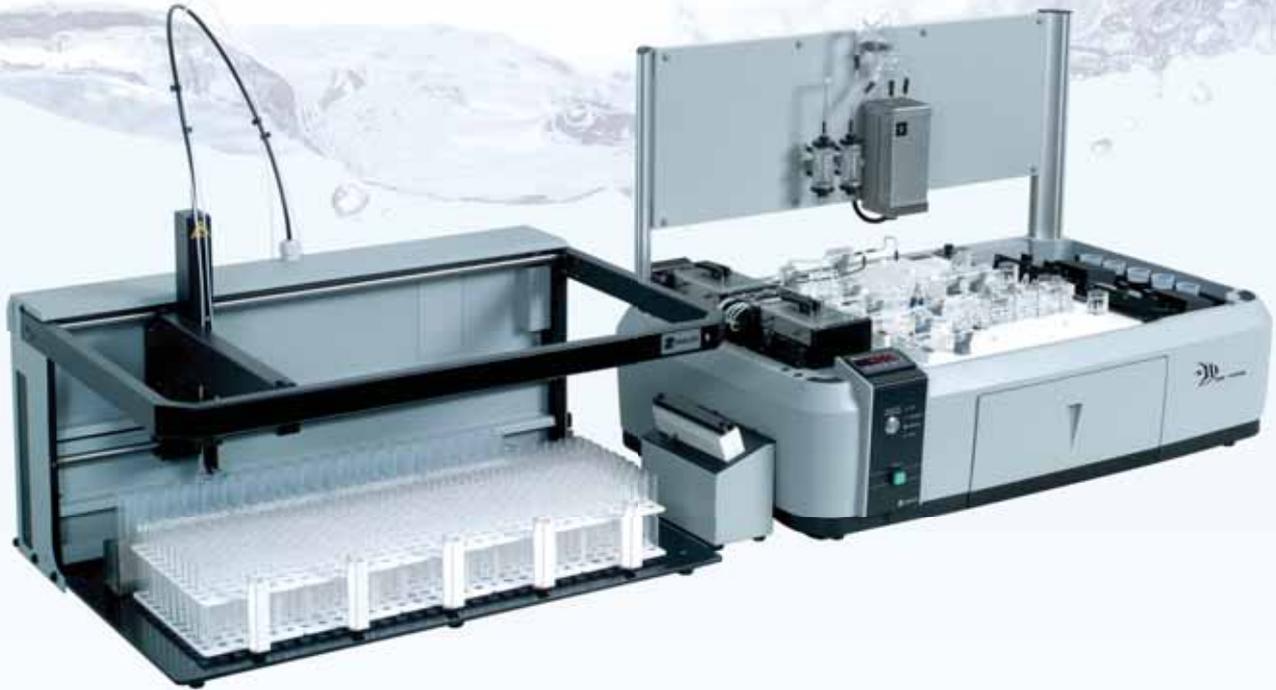


Tobacco

In the tobacco industry, the San⁺⁺ is a key element for process and quality control. It is used to analyze raw materials as well as the final product. Typical applications are Ammonia, Chloride, Nitrate, Total Reducing Sugars and Nicotine content. The modular concept of the San⁺⁺ analyzer provides a design that is unique to every laboratories requirements.

Other fields of applications in daily routine operation for various industries:
Food - Beverages - Pharmaceuticals - Wine
Mining - Metallurgical Industry - Detergents

Range of Auto Samplers



The San++ samplers offer each routine laboratory and application the perfect match saving operator time & errors.

With the unique automatic standard preparation and over range dilution facility, high workloads are fully automatically analyzed outside working hours, without any operator supervision.

1100 / 50

This random access carousel sampler is easy to use and quickly to set up for complete automation. The unit holds up to 100 sample positions and an alternative cup plate is available with dedicated positions for calibration solutions. Priority samples can easily be inserted into the work list during the analysis. The sampler is fully controlled by the software and can be equipped with a soft keypad for manual control (1150).



1050

With its 140 sample positions, this sampler is perfectly suited for laboratories with medium sized sample batches. Standards, blanks, etc. are housed in separate reservoirs. An optional dilution station can be integrated for the automatic preparation of working standards and pre & post dilutions. When simultaneous pick up of two different samples is required a dual needle configuration is available.



1074

This sampler accommodates 300 samples with up to four needles to allow the simultaneous pick-up of up to 4 samples with different matrices. A separate tray with 40 positions is available for standards, blanks, and QC samples. Automatic preparation of working standards and sample dilution makes the sampler a versatile tool to automate large sample batches and increase the laboratories capacity and flexibility.

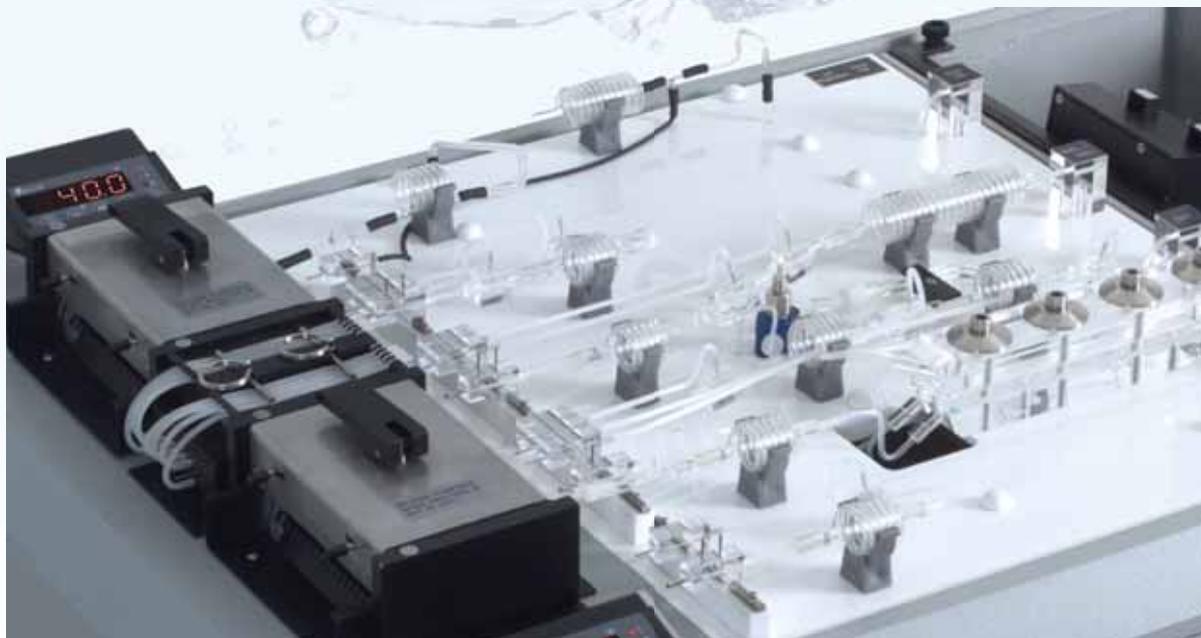


1075

This auto sampler carries up to 576 samples. In addition there is a separate tray with 26 positions available for QC samples, working standards or drift control samples. The sampler can be customized to fit your sample vials and sample racks and be equipped with multiple needles to allow the simultaneous analysis of samples with different matrices or with different sample pretreatment procedures. A dilution station can be integrated for the automatic preparation of working standards and pre & post dilutions.



San++ Chemistry Section



The San++ chemistry section consists of a pump unit, an air segmentation injector, chemistry application modules with individual waste receptacles and data detection with digital detectors.

The chemistry application modules include all the required components to completely automate the analysis. All parts are integrated into separate sections in the chemistry unit. The well-proven, compact, modular design is easily accessible for adjustments and maintenance.

The analyzer is equipped with a robust peristaltic pump, consisting of up to 32 pump tubes. The pump unit consists of a separate integrated air-injection system, providing reproducible and accurate segmentation. 3-cuff pump-tubes are used to reduce maintenance and double the lifetime of the pump tubes.

The chemistry unit can be set up with up to 5 chemistry modules. Complex manipulations such as distillation, in-line UV digestion, extraction, etc. are incorporated on the chemistry modules and minimize sample preparation work by the operator.

The San++ is for example ideal for manipulations where sample clean up is necessary. The use of inline dialysis removes interferences of particulates and interferences due to the background color of the sample.

The high-resolution digital photometric detectors are integrated into an easy accessible, separate compartment of the chemistry unit. Each detector consists of an optical detection head with up to two filters and flow cells. A wide range of flow cells, running from 5 mm to 250 cm, is available. The high-resolution detection results in an optimum signal-to-noise ratio assuring lowest detection limits and a wider dynamic range.



In addition to photometric detection a wide range of other detectors can be connected to the Skalar San++ analyzer such as Infrared (IR) detectors, UV detectors, flame photometers, Ion Selective Electrodes (ISE), fluorimeters and amperometric detectors

FlowAccess V3™ Software

This multi-tasking data acquisition and instrument control software has been designed based on decades of experience in continuous flow analysis.

This has resulted in an easy to operate and versatile tool enabling full analyzer control. The accurate data processing, reporting, automated Quality Control features including CLP protocols and data export to LIMS perfectly fits in today's laboratory environment.

Various access levels can be defined to prevent unauthorized entry. The raw data files are stored separately so they are never compromised during data handling. The main control screen shows schematically the presentation of the San⁺⁺ analyzer installed, including displays of samplers, chemistry units, applications and detectors. This quick recognition makes it easy for daily routine operations. The software is designed to provide instant control of all parts of the analyzer.

A table wizard is used to create quickly a sample table for the calibration standards, the drift/wash and CLP intervals for the samples (unknowns). Sample workloads can be imported manually, from a LIMS file or ASCII/Excel or by a barcode reader.

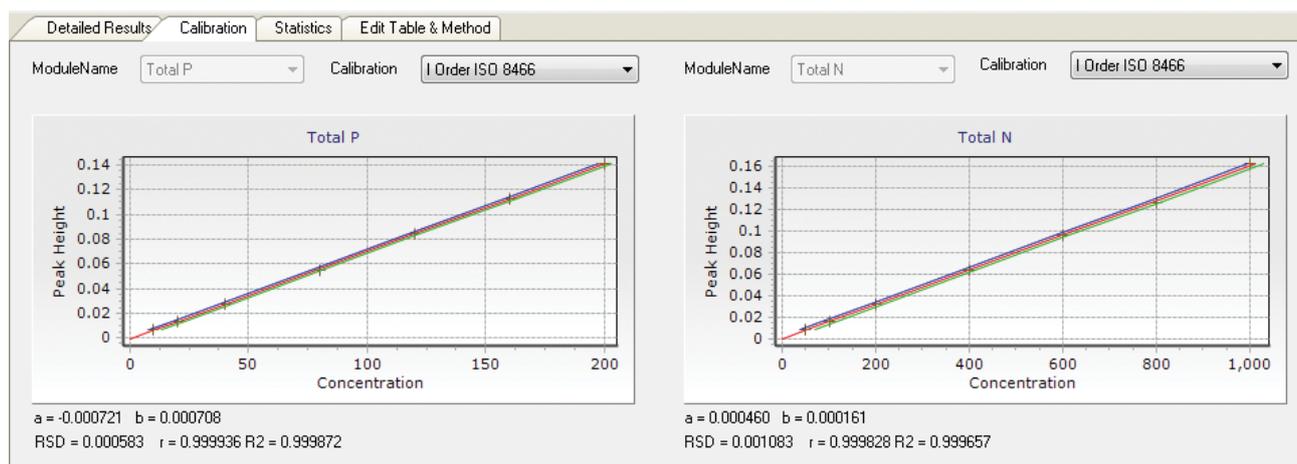
During the analysis all the analysis peaks can be viewed, either a detailed view of one channel or a multi-channel view of up to 16 channels simultaneously. Peak marking, sample ID and further information including calculated results are displayed in real time and can be examined on each individual sample.

Integrated quality control features assure accurate results and full compliance with required regulations. These include full statistical support based on ISO 8466 and quality control according CLP protocols. The CLP protocol allows automatic actions of the San⁺⁺ system itself if QC and CLP limits are exceeded. This guarantees the production of highly accurate results and automatic quality control on the San⁺⁺ analyzer's performance.



SOFTWARE FEATURES

- Table wizard, for quick set up of the sample workload
- Real time graphical screens for multiple channel views or detailed view of one channel
- Real time result calculations by 1st, 2nd order according to ISO 8466 or 3rd order and inverse logarithm for use with Ion Selective Electrodes
- Pre- and post dilution factors per parameter
- Automatic analysis of overrange samples
- Extensive Quality Control criteria incl. CLP/GLP protocols
- Full data protection according to 21 CFR Part 11
- AQC™, for statistics calculations and sensitivity of the analyzer results in time periods
- FlowReports™ for customized and advanced reporting



Options and Accessories

The San⁺⁺ analyzer offers a unique solution towards automated wet chemistry analysis.

A number of options and accessories for the San⁺⁺ analyzer are available. They allow the analyzer to be completely customized in order to meet the requirements and high standards of today's modern laboratories. If the requirements change in the future, the analyzer can be expanded, without compromises.

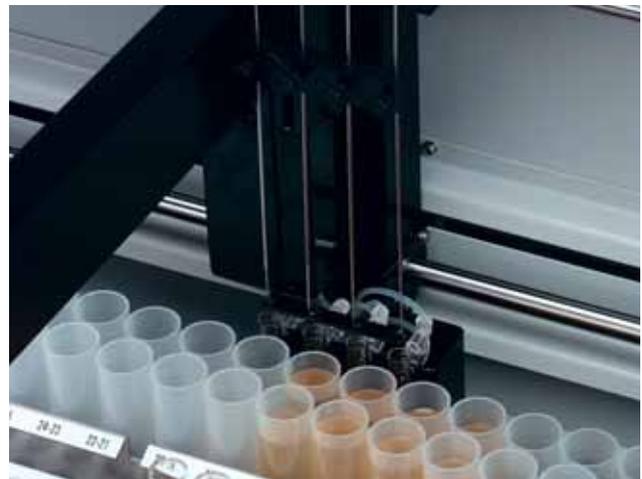
Unattended and extended hours of operation

The San⁺⁺ offers computer-controlled valves for complete automation. This avoids manual manipulation of reagent-lines and eliminates possible operator error. The computer controlled valves allow the analyzer to automatically start-up and shut-down, including programmable rinse cycles without operator intervention. This effectively extends the operation time of the analyzer and increases sample throughput.



Multiple needle sample pick-up and sample mixing

Samples of two different matrices can be analyzed in one analysis run, by using multiple sample needles on the auto sampler. When solids in samples are likely to settle and are of significance to the analysis, a unique sample-mixing device can be added to the auto samplers for homogenous and reproducible sampling.



Automatic dilutions & preparing working standards

To extend the analytical range of the application, a built-in dilution station can be added into the auto samplers. If the concentration of the sample is outside the calibration curve, the sample is automatically diluted and re-analyzed without operator intervention. Samples can also be pre-diluted prior to analysis when concentrations are known to be over-range. Furthermore, the dilution station can prepare working standards automatically from a standard stock solution.



Integrated Leak Detectors

To protect the analyzer and the environment, the San⁺⁺ is equipped with a three-position leak detection system. This enables the unit to be continuously monitored for spillages and allows for fast intervention. If a leak occurs pumps will be stopped and an alarm goes off.

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