A new dimension in process monitoring

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Metrohm Ion analysis

ProcessLab

Summary

Metrohm has combined the best aspects of laboratory and online systems to create the 875 ProcessLab – a fully customized, automated atline system for process monitoring. While process-integrated online systems are used for high analysis frequencies, atline analysis systems are applied to long analysis cycles or wherever various parameters are to be measured at different measuring points.

ProcessLab has a compact design that allows for close positioning to the actual process and thus yields faster and more reproducible results. The modular design of ProcessLab gives complete flexibility allowing the configuration of application-specific systems. This flexibility also makes it possible to extend or reconfigure a system in view of future analytical testing needs.

With its ability to be configured for a wide scope of applications in various industries, ProcessLab is a perfect system for the production floor, laboratory or anywhere in between. The electronic components are hermetically separated from the wet-part modules and protected against dust and splashing liquids in harsh plant environments. The reliable industrial PC and PLC-driven I/O Controller make for extensive control and communication possibilities using standard communication protocols. Result outputs can be provided as a direct link to the process control center via analog/digital signals or can be delivered via local network to a plant engineer or laboratory manager. Effective monitoring of real-time results can help tighten specifications, detect problems early and avoid wasting money on out-of-spec products.

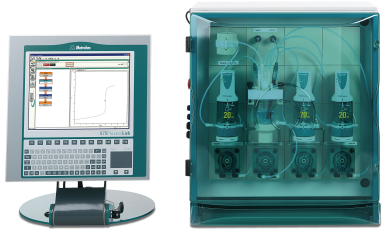
ProcessLab is easy to use, robust and provides fast, reliable results for safe process control.

Introduction

875 ProcessLab is Metrohm's answer to the demand for professional laboratory equipment at the process line as well as for an analyzer that is both robust and flexible. Fully customizable ProcessLab meets chemical manufacturers' analytical testing requirements by constantly monitoring product quality atline.

As a cross between a laboratory and an online analyzer, ProcessLab offers numerous advantages such as: positioning at the production line to allow for rapid and reproducible results, it is more economic than online systems and just as flexible and reproducible as laboratory offline systems. The modular design, configuration flexibility and robustness for a harsh process environment make it ideal for the severe conditions common in process plants.

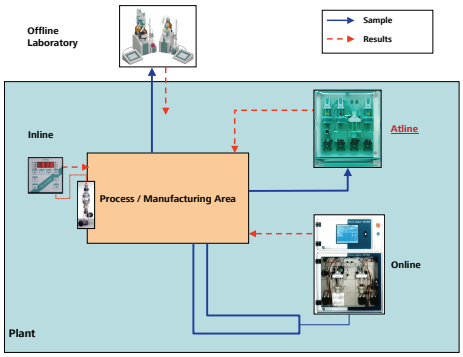
tiamo™ software fully controls ProcessLab's operation and is capable of exporting results to LIMS. ProcessLab's integrated I/O Controller can incorporate external information into the system for parameter or measurement control as well as serve to output analytical results and signals to a process control system, linking the atline system to the process environment.



ProcessLab in the manufacturing process

ProcessLab is designed as an atline system. Samples are taken from a process, delivered to and identified at the unit and finally analyzed automatically on-site.

ProcessLab's compactness allows close positioning to the actual process for faster results. Its simple, modular design makes it easy to install and operate.



Analyzer modules

ProcessLab's robustness makes it ideal for the harsh conditions that are common in most process plant environments. Entirely modular in design, the custom-tailored analysis module contains exactly those components that are required for the analysis to be carried out.

Base system + **Available modules** = **Customized system**

- 800 Dosino
- 807 Dosing Units
- Vessel with magnetic stirrer
- Peristaltic pumps
- Sample loops
- Overflow pipettes
- Valves
- Sensors
- Liquid level sensor

ProcessLab analytical techniques

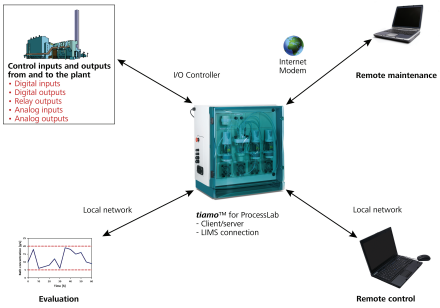
As a result of the high flexibility of the individual modules and the numerous communication possibilities, the systems are very versatile. A few of the typical application fields of the instruments are listed below:

Branch	Analysis technique	Application
Automotive industry	Titration	Free and total acids, alkalinity, NO_2^-, Zn^{2+} and F^- in different baths of the phosphatizing process
Plating and electroplating industry	Titration	Cu^{2+} and H_2SO_4 in copper baths
	Titration	Ni^{2+} and H_3BO_3 in nickel baths
	Titration	Fe^{2+}/Fe^{3+} as well as free and total acidity in etching baths
	CVS[1]	Determination of organic additives such as brighteners and suppressors in acidic copper baths
Chemical industry	Titration	Acids and bases in the production of intermediates and final products
	Titration	Quality control of fine chemicals
Metallurgy and metal working industry	Voltammetry	Metal ions in salts and high-purity chemicals
	Titration	Determination of CN^- and alkalinity in process waters of the steel industry
	Titration	Analysis in ore extraction and metal production
	Voltammetry	Cd, Tl and other Me^{n+} in zinc electrowinning solutions
Semiconductor and electronic industry	Titration	Acid mixtures in the semiconductor industry
	Titration	H_3BO_3 in baths for surface treatment in the production of TFT screens
Food and beverage industry	Titration	Chloride in instant soups
	Titration	Total acidity in fruit juices and concentrates
Pharmaceutical industry	Titration	Quality control of alkaline and acidic products
	Titration	Multiple parameters in active ingredient analysis
Plastics industry	Voltammetry	Analysis of organics such as 4-carboxybenzaldehyde in polyterephthalic acid (PET production)
	Voltammetry	Free styrene in polystyrene (production of ABS plastics)
Paper and pulp industry	Titration	Free and bound SO_2 in process baths
Water industry	Voltammetry	Traces of metal ions such as Cu^{2+}, Cd^{2+}, Zn^{2+} and Pb^{2+} in drinking, sea and waste water

[1]Cyclic Voltammetric Stripping

Data communication

All analysis methods and results are centrally recorded, managed on a common database and available for monitoring as well as for direct and feedback control. Data can be exported via ethernet to any LIMS, made available to a process control system or be used in the company's intranet. The digital and analog input/output (I/O) components allow the system to be easily incorporated in the process surroundings. In this way it can react to different input signals, for example automatically measure different parameters depending on the sample, trigger an alarm if limits are infringed or transfer measured values as analog 4…20 mA signals. With the second ethernet connection (RJ45) ProcessLab can be integrated in a local network or be fully operated by remote control.



References

(1) F. Portala, A. Steinbach, F. Müller, M. Feige and G. Kirner, Metals in dip coating baths, Process Worldwide, 2007(4), 30-31.
(2) Using ProcessLab for monitoring a phosphatizing process, Metrohm Information, 36(2), 2007, 17-19.
(3) Determination of cyanide in process water of the steel industry, Metrohm Information, 37(1), 2008, 26-30.
(4) Metrohm Application Bulletins AB-288, AB-289, AB-292, AB-295 and AB-300, http://products.metrohm.com

Download a copy of this poster from http://products.metrohm.com (search for 8.000.6031EN).

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