

Interactive Communication with Instrument to Realize Effective Analytical Workflow in the Laboratory

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Introduction

The laboratory in which instruments are installed and the office in which operators perform day-to-day operations are usually far apart from each other. Consequently, analysts spend a great deal of time moving between both locations.

Interactive communication with instruments improves

productivity and promotes an advanced laboratory environment with operation capabilities from a built-in touch panel and a smart device, enabling a PC-free laboratory as well as enabling necessary operations in various situations.

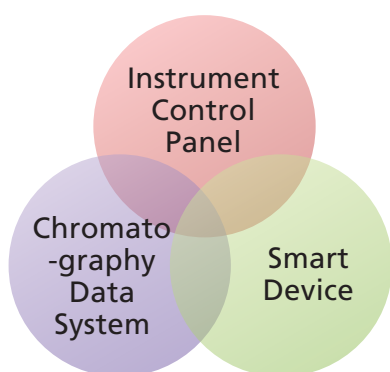


Figure 1: Interactive communication with instrument improves productivity.

Analytical workflow in the laboratory

The analytical workflow in the laboratory consists of the entire series of analysis operations, from system startup, mobile phase purging, column equilibration

in preparation for starting measurements, and starting the analysis to shutting down the system after analysis.

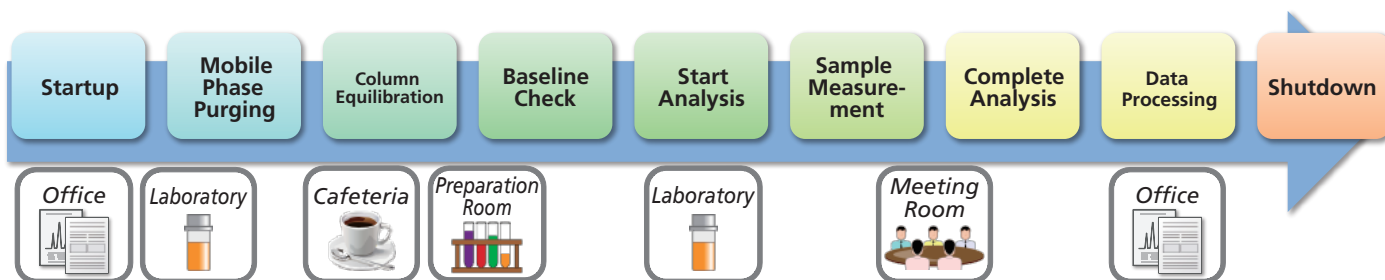


Figure 2: Interactive communication with instrument brings about changes in the laboratory and office

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Issues to be solved

Before Analysis

Carry out a series of operations for conditioning



<< Solution >> Automate analytical conditioning

- Automatically purge mobile phases before analysis.
- Monitor baseline noise and drift, automatically check if the values are within criteria.

During Analysis

Stay in the lab to confirm the status



<< Solution >> Remotely monitor the analytical status

- Utilize smart device such as a mobile phone and a tablet PC.

After Analysis

Review and process many data



<< Solution >> Browse and process multiple analytical data in one Window

- Utilize a Chromatography Data System (CDS) for rapid processing of data, easy confirmation of analytical results in the office.

Enhance total productivity of the entire series of analysis operations

Interactive communication with instrument enables operators to perform minimal operations to start an analysis via the instrument while the data acquisition is synchronized with a CDS.
In addition, a smart device such as a smartphone or a

tablet PC can be used as a simple multi-functional terminal. These information terminals create a new paradigm to start analysis and remotely monitor system status and chromatograms without using any special software.

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Before Analysis

These operations can be quickly done on the instrument panel at the time mobile phases are set and a column is attached.



Autopurge

Automatically purge mobile phases before analysis by setting purge lines and purge time.



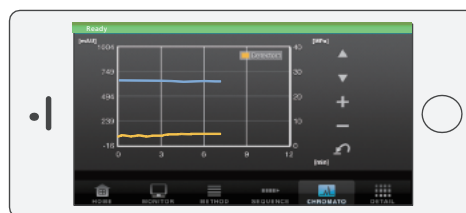
Column Equilibration

Turn on the oven temperature control and flow mobile phase with appropriate flow rate.



Baseline Check

Monitors baseline noise and drift values, automatically determines that the values are within criteria.



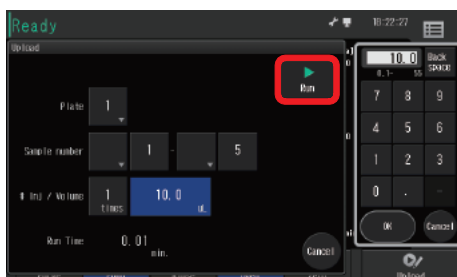
On the smart device

Instrument status such as pump pressure and oven temperature can be monitored from anywhere in the facility.

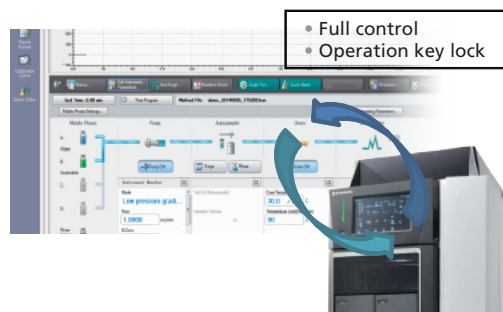
Figure 3: Preparation for starting measurement

Start Analysis

Perform routine operations while away from the PC.



Enables the operator to edit analysis methods and start sequences from the instrument. (The operations can be disabled for the regulated laboratory.)



Methods and sequence are uploaded from the instrument to a CDS.

Figure 4: Start analysis on the instrument panel

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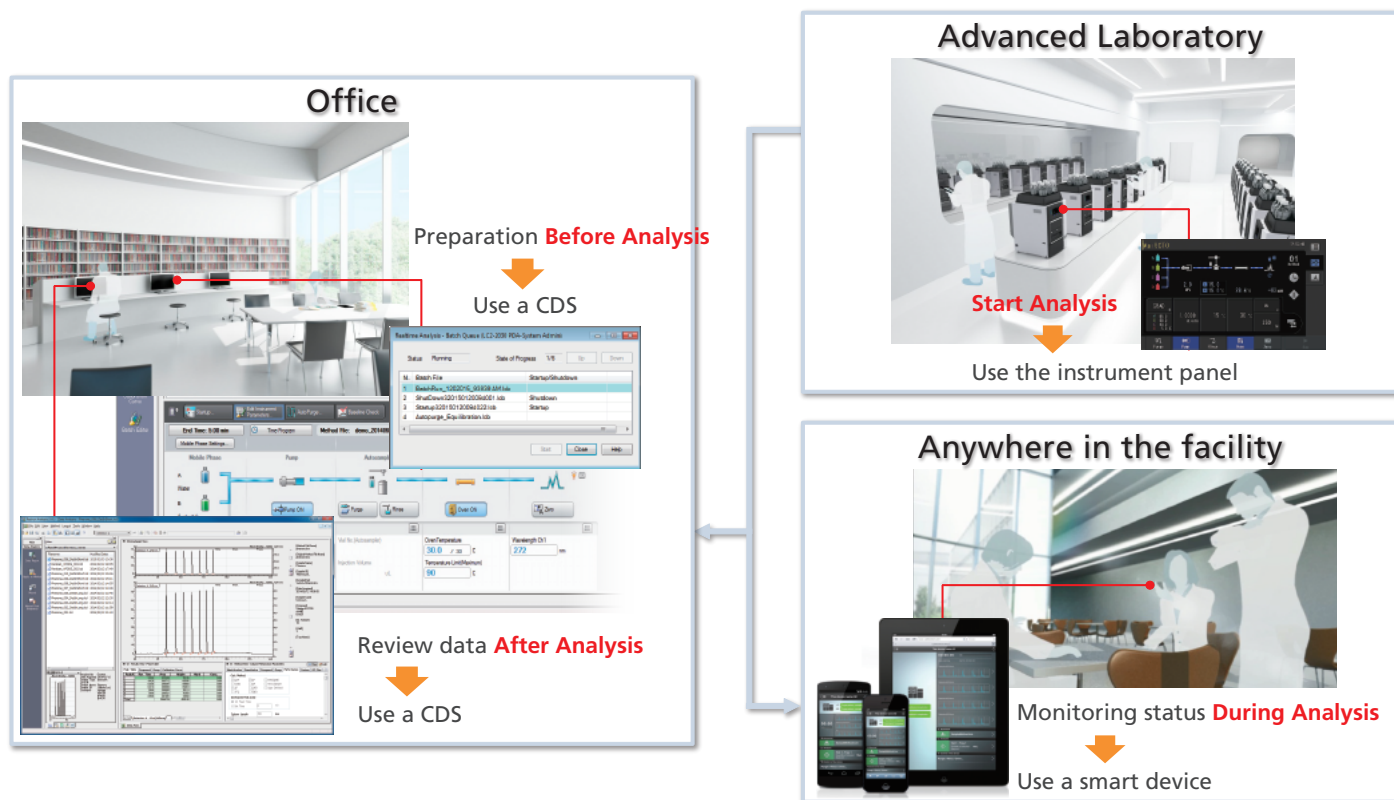


Figure 5: Interactive communication with instrument frees operators from the laboratory

During Analysis

Remotely monitor the analytical status.

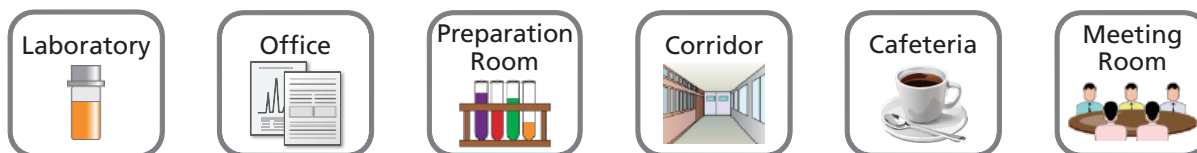
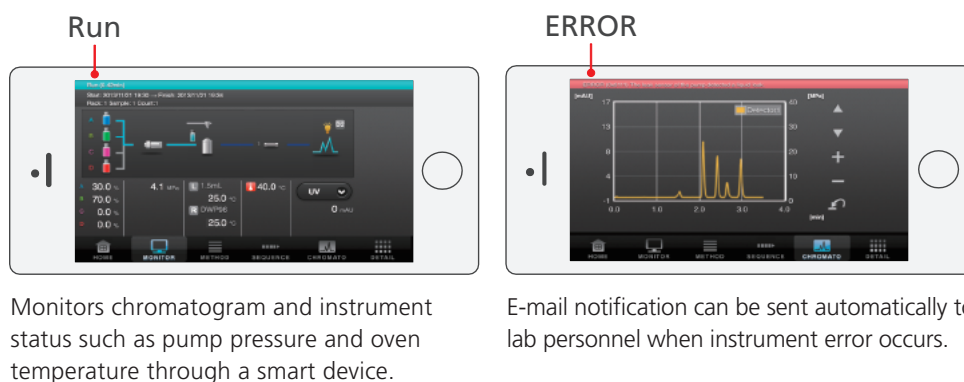


Figure 6: Monitoring instrument status anywhere in a facility

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After Analysis

Not necessary to worry about when an analysis ends. An e-mail notifies when analyses are completed.

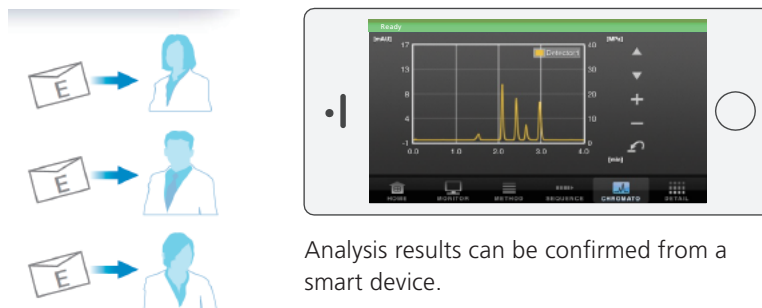
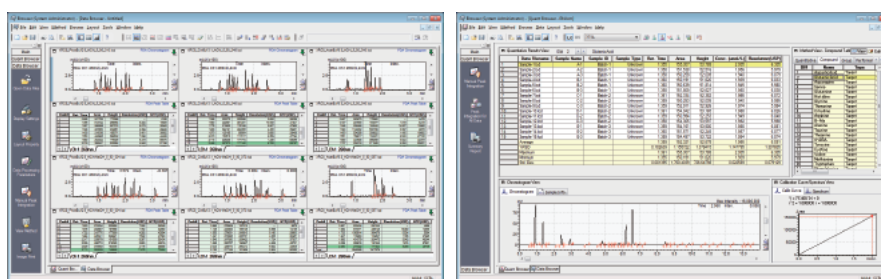


Figure 7: E-mail notification



Browse a high amount of analytical data in one window by using a CDS in the office

Figure 8: Review and process data

Other operations in the laboratory

Reduce maintenance time

- Confirm the life status of consumables on the touch panel.
- Change consumable parts in front of the instrument.
- Navigate the maintenance operations on the touch panel.



Figure 9: User friendly maintenance operations on the touch panel

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Reduce validation effort

- Auto-validation function allows examining solvent delivery stability, wavelength accuracy, absorbance accuracy, gradient accuracy, the presence of any drift/noise, and other parameters by following the instructions on the touch panel.
- Perform the routine inspections before using the instrument, and create a report indicating system self-diagnostic results and a record of consumables used.



Figure 10: Proof the system always operates in a stable manner

Conclusion

The interactive communication with instrument enables necessary operations in necessary situations. The operations in the laboratory are minimized and performed free of errors. More efficient use of laboratory is realized.

innovative Realize advanced laboratory

- Minimize the operations in the laboratory
- Maximize reliability and stability

intuitive Achieve easier operation

- Integrate the operation procedures between system and CDS
- Processing large amount of data and confirm the results in one Window

intelligent Increase work efficiency

- Perform the system check before using the instrument
- Automate a number of routine analysis procedures