

Technical Report

IC Support Software Total Support from Analysis to Maintenance

Katsuaki Koterasawa¹

Abstract:

Ion chromatographs are widely used in a broad range of fields, including environmental science, pharmaceuticals, food, and chemicals, and are primarily used for quantitative ion analysis. Ion chromatographs are required to operate properly and be used without error in order to obtain accurate results. IC Support Software is software that supports smooth analysis using Nexera™ IC. For everyday tasks, IC Support Software includes a basic operations guide that explains the essential procedures for using an ion chromatograph, as well as a troubleshooting feature that identifies likely causes and countermeasures from observed phenomena when a problem occurs. In addition, to help ensure proper instrument operation, it includes consumables management and maintenance videos that allow users to perform maintenance themselves. These diverse functions support everyday tasks, reduce downtime, and help ensure smooth analysis using ion chromatographs.

Keywords: Ion Chromatograph

1. Introduction

Amid growing environmental concerns and increasing regulatory compliance requirements, ion chromatographs are widely used in test methods specified by various regulations in the environmental field, where they are expected to deliver accurate and highly reliable analytical results. To ensure that analytical data is highly reliable and accurate, ion chromatographs must be easy to use and function without errors.

IC Support Software is equipped with functions that provide full support, from everyday tasks to responses to unexpected troubles. For everyday tasks, IC Support Software includes a basic operations guide that explains the essential procedures for using an ion chromatograph, as well as a troubleshooting feature that identifies likely causes and countermeasures from observed phenomena when a problem occurs. In addition, to help keep the instrument operating properly, it includes consumables monitoring and maintenance videos that allow users to perform maintenance themselves.

These diverse functions support everyday tasks, reduce downtime, and help ensure smooth analysis using ion chromatographs (Figure 1).

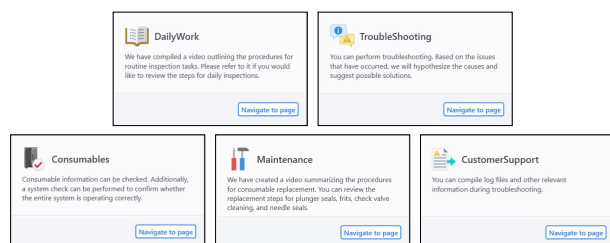


Figure 1: Five Features of IC Support Software

2. Support for Everyday Tasks

2.1 Basic Operation Guides

Basic operation guides provide step-by-step explanations of the analysis process, from pre-analysis tasks such as reagent formulation and eluent loading, to software-based tasks such as sample registration, data acquisition, and data analysis (Figure 2). Users unfamiliar with the Nexera IC ion chromatograph or with data acquisition and analysis software often require help during pre-analysis processes such as purging and column equilibration, as well as for operating the control software. IC Support Software uses instructional videos to explain each procedure clearly. Each step is broken down into detailed procedures and organized into separate chapters for easy review when a user wants to repeat a particular section (Figure 3). This feature enables anyone to easily and reliably perform analysis using Nexera IC.

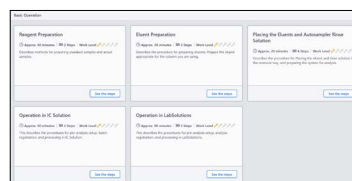


Figure 2: Selection Window in Basic Operations Guide

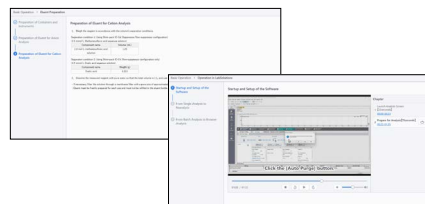


Figure 3: Instructional Video in Basic Operations Guide
(Instructional videos included in the software explain procedures for reagent preparation and software operation)

2.2 Troubleshooting

Issues can occur during ion chromatographic analysis for a variety of reasons. For example, compared with normal operation, retention times may shift, peak areas may be small, and peak shapes may be abnormal. Because such issues can have various causes, it is necessary to check the system status and data to determine the cause and appropriate countermeasures, which requires experience and knowledge.

The troubleshooting feature in IC Support Software uses an interactive format to check the system status and analytical results, narrow down the likely cause and countermeasures, and suggest how to resolve the issue (Figure 4). The user only needs to answer the software's questions and instructions to identify the cause and resolve the issue.

Also, if troubleshooting does not resolve the issue, the details can be carried over to the inquiries window.

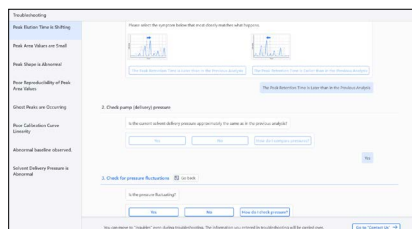


Figure 4: Troubleshooting Window

3. Reducing Equipment Downtime

3.1 Consumables Management

One of the requirements for proper analysis is to keep the system in a normal state, that is, to keep consumables within their recommended usage limits. To avoid problems caused by wear and deterioration, users can view a list of consumable statuses for each instrument in the consumables management window of IC Support Software (Figure 5). The consumables list corresponds to the system diagram, making it easy to immediately identify which part's consumable needs replacement.

Also, when maintenance is needed, the user can move to the maintenance window in IC Support Software with a single click.

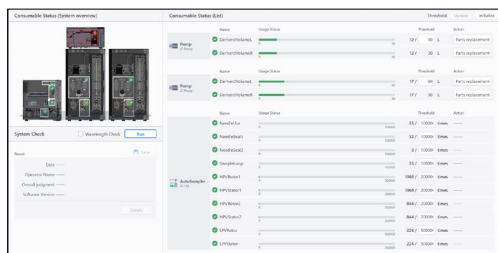


Figure 5: Consumables Management Window

3.2 Maintenance

The maintenance window in IC Support Software explains maintenance tasks that users can perform themselves. Example maintenance procedures include cleaning or replacing the plunger seal and check valve of the liquid delivery pump, and replacing the needle seal of the autosampler. Each procedure is explained in steps using videos and diagrams, and the videos can be replayed chapter by chapter.

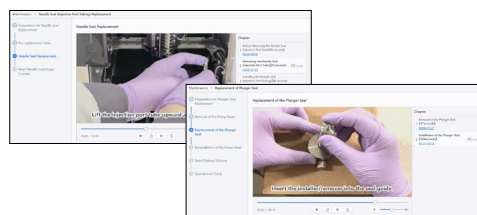


Figure 6: Maintenance Videos
(Top: Needle seal replacement, Bottom: Plunger seal replacement)

3.3 Inquiries Feature

If an issue is not resolved by troubleshooting, the user may contact Shimadzu's technical support team. Providing the system status and issue details accurately makes technical support smoother.

IC Support Software includes a feature that compiles the troubleshooting details and related data into a compressed file for output (Figure 7). The inquiries feature can also automatically perform a system check and output system configuration, version information, and consumable status together.

This reduces back-and-forth during inquiries and helps reduce downtime.

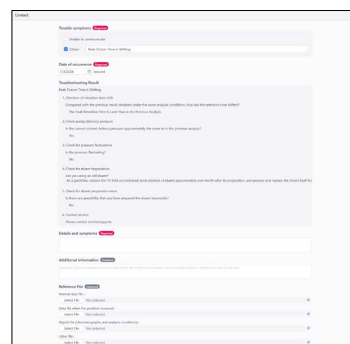


Figure 7: Inquiries Window

4. Conclusions

To improve the efficiency and reliability of analysis using ion chromatographs, it is essential to create an environment in which users can operate the instrument easily and the instrument can function properly. IC Support Software offers users a variety of features that assist everyday tasks, reduce downtime, and ensure the streamlined and reliable operation of ion chromatograph system.



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