



Trace elemental analysis

Thermo Scientific iSC-65 Autosampler and Qtegra ISDS Software: reliability to power through your challenging ICP-OES and ICP-MS workflows

Keywords

ICP-OES, ICP-MS, autosampler, Trace Elemental Analysis, Qtegra ISDS Software, automation, sample introduction

The Thermo Scientific™ iSC-65 Autosampler, controlled by Thermo Scientific™ Qtegra™ Intelligent Scientific Data Solution™ (ISDS) Software, is a robust, feature-rich sample introduction system with advanced hardware and software capabilities designed to improve productivity and profitability in your routine workflow.

The iSC-65 Autosampler is compatible with the Thermo Scientific™ iCAP™ PRO Series ICP-OES and iCAP™ Qnova Series ICP-MS instruments. It is ideally suited for use in applications in environmental, food, industrial, battery technology, sustainable fuels, petrochemical, and pharma markets that require reliable sampling over extended periods.

Key hardware features

- An industry-proven three-axis screw thread design reliably drives the sample probe with sub mm accuracy and precision.
- Materials that are resistant to common chemicals and acid are used throughout, allowing for reliable, contamination-free operation over extended periods.
- Up to four industry standard sample racks can be installed at one time. Racks with vial capacities of 21, 24, 40, 60, and 90 are supported.
- A dedicated area for 50 mL (either flat or round base) tubes is provided, ideal for solutions that need to be repeatedly analyzed, for example, quality control standards.

- In case of accidental spillage, the sample rack tray can be removed, and fittings are provided to support either a gravity drain to the front or a pumped drain to the rear of the iSC-65 Autosampler.
- The two-channel rinse station is fed by a dedicated rinse pump that can be used to remove excess rinse solution or fitted to a gravity drain. The rinse station is removable for cleaning and is connected to tubing with luer style fittings for ease of use and peace of mind.

Key sampling capabilities

- Step Ahead – sends the probe to the rinse station during data acquisition, using the sample volume in the probe and transfer tubing to complete the analysis. Less sample solution is required, decreasing waste and instrument wear, and less time is required to rinse, reducing rinse solution usage and accelerating sample throughput.

- Flexible sampling depths – vial-specific probe depths enable correct sampling to avoid suspended particles that could otherwise lead to blockages, minimizing maintenance and potential exchange of sample introduction components.

Software features built on hardware capabilities

- The Thermo Scientific iSC-65 Autosampler is controlled through a dedicated software plug-in within the Qtegra ISDS Software platform. A high clarity, easy to follow, visual workflow is carried through multiple views.
- A dedicated view for the iSC-65 Autosampler is accessible in the Qtegra ISDS Software Dashboard that provides access to common autosampler actions – probe movement, pump speed control, etc.

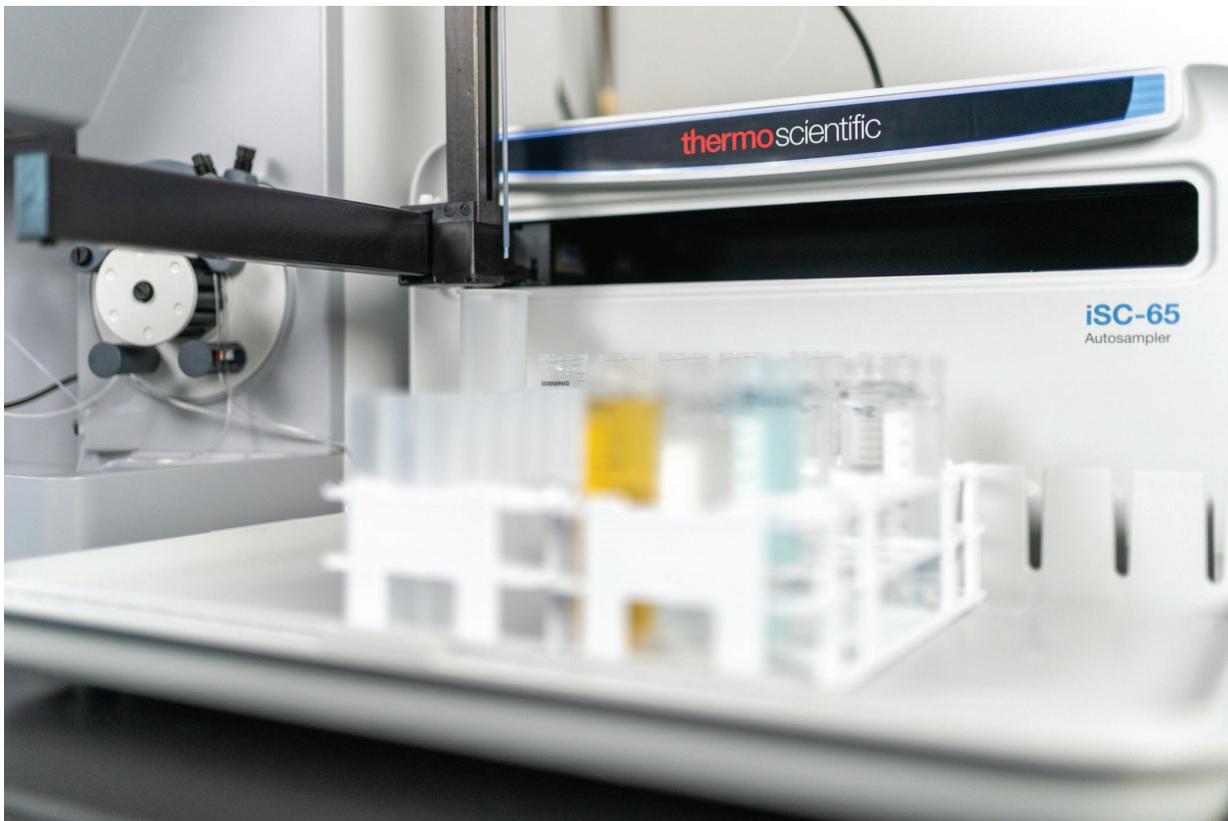


Figure 1. iSC-65 Autosampler with racks occupying two of four positions

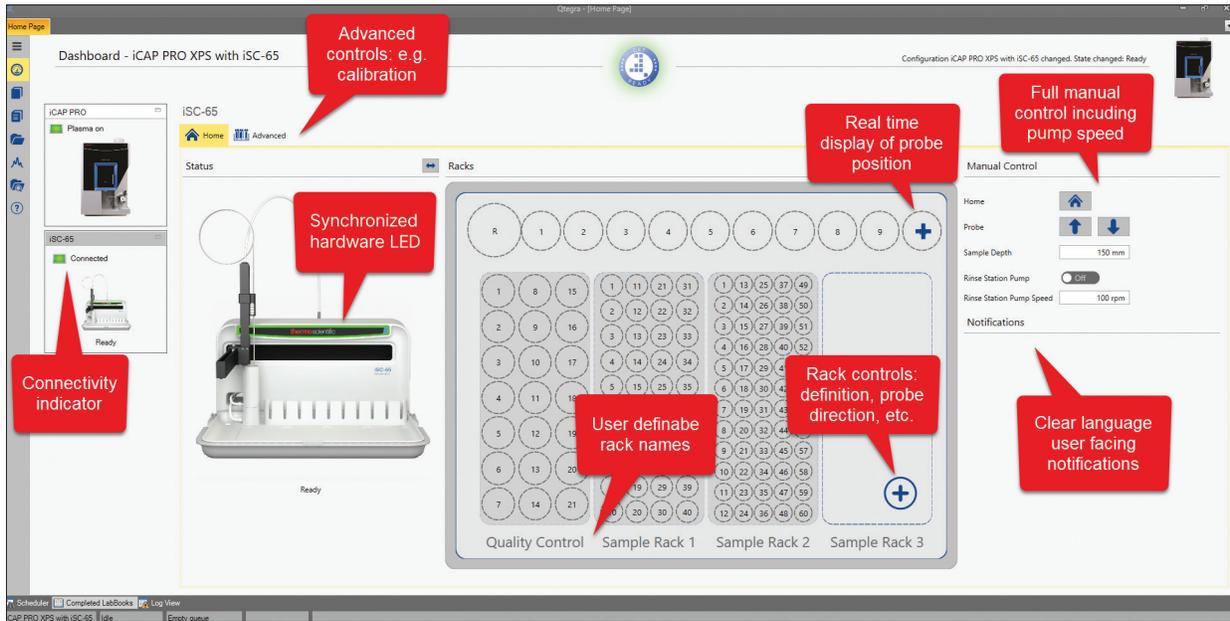


Figure 2. iSC-65 Autosampler display in the Qtegra ISDS Software Dashboard

- The iSC-65 Autosampler features a large, bright, easy to see LED display that conveys essential feedback to the user. Rather than rely on small, single color dots that are limited to binary ON/OFF status feedback (and are difficult to see in busy laboratories), the iSC-65 Autosampler displays information on both analysis and hardware status:

Green (solid): no action required: online and/or operation successful.

Green (intermittent): performing the automated, instrument specific Get Ready process.

Blue (intermittent): processing analysis.

Red (solid): action required; operation unsuccessful.

Red (intermittent): action required; autosampler hardware error.

Red (clockwise halo): autosampler not connected.

- All physical LED information is duplicated in the iSC-65 Autosampler section of the Qtegra ISDS Software Dashboard for ease of use in remote control scenarios.
- Obstruction detection – physical restriction of the probe in any axis of movement, e.g., from an uncapped vial or other obstruction, is recognized as an error, stopping the analysis. A clear text message is displayed in the Qtegra ISDS Software Dashboard, with suggested corrective actions and is only cleared after customer input.

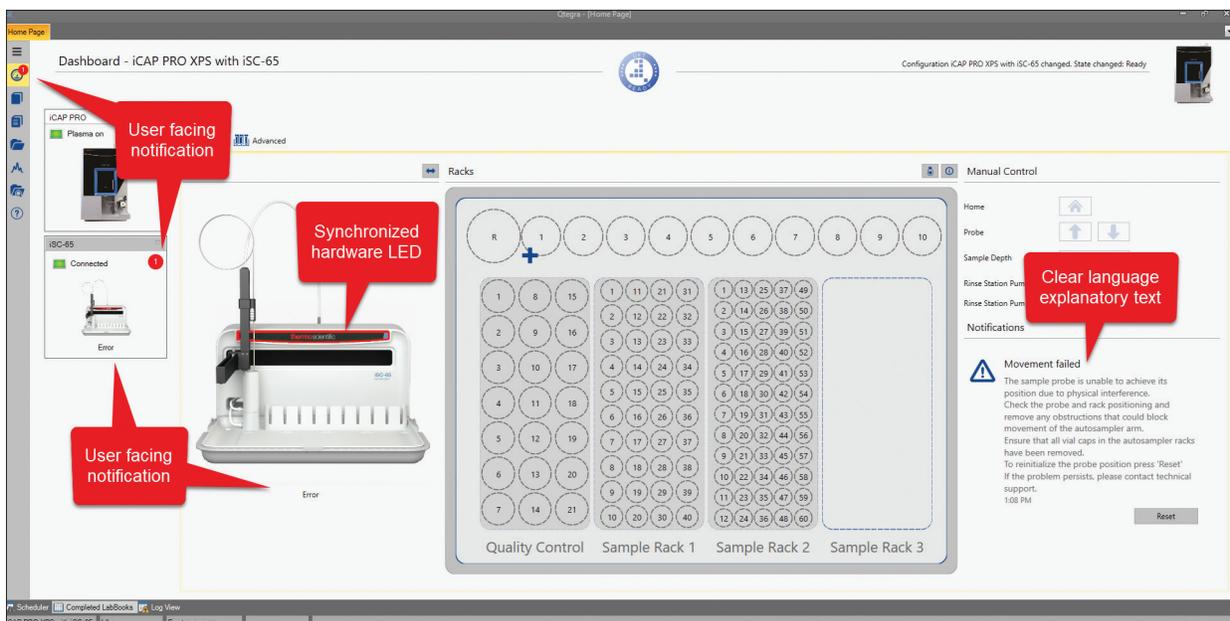


Figure 3. iSC-65 Autosampler display in the Qtegra ISDS Software Dashboard

- The iSC-65 Autosampler allows for user customization of autosampler racks. Racks can be renamed (for example to define a 21-position rack with 50 mL vials for multi-analysis solutions, such as Quality Control standards), and both the start point and order of vial progression are user definable to support existing workflows.

- Color coding in the Qtegra ISDS Software Sample List allows the user to distinguish the various sample types: Quality Controls, Standards, Blanks, and Unknowns.
- This approach is carried through into the rack view of the iSC-65 LabBook. Completed analyses are easily identified and individual vials display additional information on measurement status.

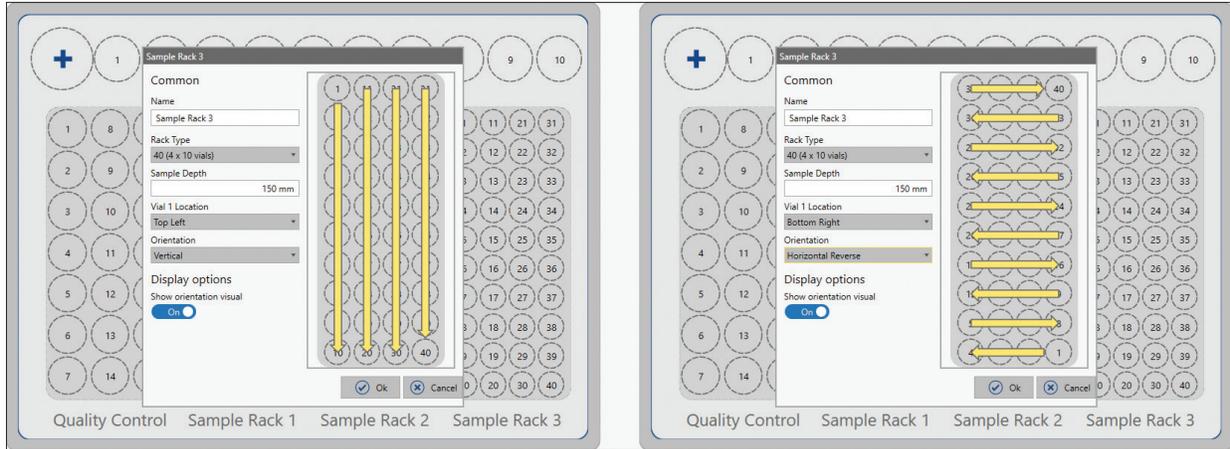


Figure 4. iSC-65 Autosampler rack configuration options

Label	Status	Repeats	Fullframes	Comment	Evaluate	Sample Type	Standard	Dilution Factor	Amount	Final Quantity	QC Action	QC Restart	QC Reference	Special Blank
Blank 01	●	10	□	<Comment>	✓	BLK		1			None			
Blank 02	●	10	□	<Comment>	✓	BLK		1			None			
Blank 03	●	10	□	<Comment>	✓	BLK		1			None			
STD 1 (5 ppb)	●	3	□	<Comment>	✓	STD	STD 1 - 5 ppb	1			None			
STD 2 (5 ppb)	●	3	□	<Comment>	✓	STD	STD 2 - 5 ppb	1			None			
STD 3 (5 ppb)	●	3	□	<Comment>	✓	STD	STD 3 - 5 ppb	1			None			
STD 4 (5 ppb)	●	3	□	<Comment>	✓	STD	STD 4 - 5 ppb	1			None			
STD 5 (5 ppb)	●	3	□	<Comment>	✓	STD	STD 5 - 5 ppb	1			None			
STD 1 (20 ppb)	●	3	□	<Comment>	✓	STD	STD 1 - 20 ppb	1			None			
STD 2 (20 ppb)	●	3	□	<Comment>	✓	STD	STD 2 - 20 ppb	1			None			
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STD 5 (20 ppb)	●	3	□	<Comment>	✓	STD	STD 5 - 20 ppb	1			None			
STD 1 (50 ppb)	●	3	□	<Comment>	✓	STD	STD 1 - 50 ppb	1			None			
STD 2 (50 ppb)	●	3	□	<Comment>	✓	STD	STD 2 - 50 ppb	1			None			
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STD 5 (50 ppb)	●	3	□	<Comment>	✓	STD	STD 5 - 50 ppb	1			None			
STD 1 (100 ppb)	●	3	□	<Comment>	✓	STD	STD 1 - 100 ppb	1			None			
STD 2 (100 ppb)	●	3	□	<Comment>	✓	STD	STD 2 - 100 ppb	1			None			
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STD 4 (100 ppb)	●	3	□	<Comment>	✓	STD	STD 4 - 100 ppb	1			None			
STD 5 (100 ppb)	●	3	□	<Comment>	✓	STD	STD 5 - 100 ppb	1			None			
Wash	●	3	□	<Comment>	✓	UNKNOW		1			None			
STD 6-Hg (5 ppb)	●	3	□	<Comment>	✓	STD	STD 6 - Hg - 5 ppb	1			None			
Blank HCl-HNO3	●	10	□	<Comment>	✓	UNKNOW		1			None			
STD 6-Hg (20 ppb)	●	3	□	<Comment>	✓	STD	STD 6 - Hg - 20 ppb	1			None			
Blank HCl-HNO3	●	10	□	<Comment>	✓	UNKNOW		1			None			
STD 6-Hg (50 ppb)	●	3	□	<Comment>	✓	STD	STD 6 - Hg - 50 ppb	1			None			
Blank HCl-HNO3	●	10	□	<Comment>	✓	UNKNOW		1			None			
STD 6-Hg (100 ppb)	●	3	□	<Comment>	✓	STD	STD 6 - Hg - 100 ppb	1			None			
Blank HCl-HNO3	●	10	□	<Comment>	✓	UNKNOW		1			None			
DI only	●	3	□	<Comment>	✓	UNKNOW		1			None			
Blank 01	●	3	□	<Comment>	✓	QC		1			ICB	QC Next		
QC-STD 5 (50ppb)	●	3	□	<Comment>	✓	QC	STD 5 - 50 ppb	1			ICV	QC Next		
Tap Water 11	●	3	□	<Comment>	✓	UNKNOW		1			None			
Tap Water 12	●	3	□	<Comment>	✓	UNKNOW		1			None			
Tap Water 13	●	3	□	<Comment>	✓	UNKNOW		1			None			
Tap Water 14	●	3	□	<Comment>	✓	UNKNOW		1			None			
Tap Water 15	●	3	□	<Comment>	✓	UNKNOW		1			None			
Tap Water 16	●	3	□	<Comment>	✓	UNKNOW		1			None			

Figure 5. Analysis type specific color coding in the Qtegra ISDS Software Sample List

- The iSC-65 Autosampler plug-in provides additional, more powerful controls to simplify LabBook based Sample List generation in routine laboratories. For example:
 - Analyses can be selected and repositioned directly within the rack view as an alternative to the Sample List (spreadsheet) based definition of rack and vial position.
 - Multiple analyses can be selected and merged into a single vial – ideal for defining multi-analysis solutions, such as Quality Control standards, in complex, long-term measurements.
 - Analysis positions can be exchanged in case of error.
 - All rack view positioning follows the same Access Rights definition as in the Sample List to support compliant laboratories.
- With robust design and advanced features, the Thermo Scientific iSC-65 Autosampler accelerates ICP-OES and ICP-MS sample throughput with intuitive, configurable, precise reliability. Power through your productivity.

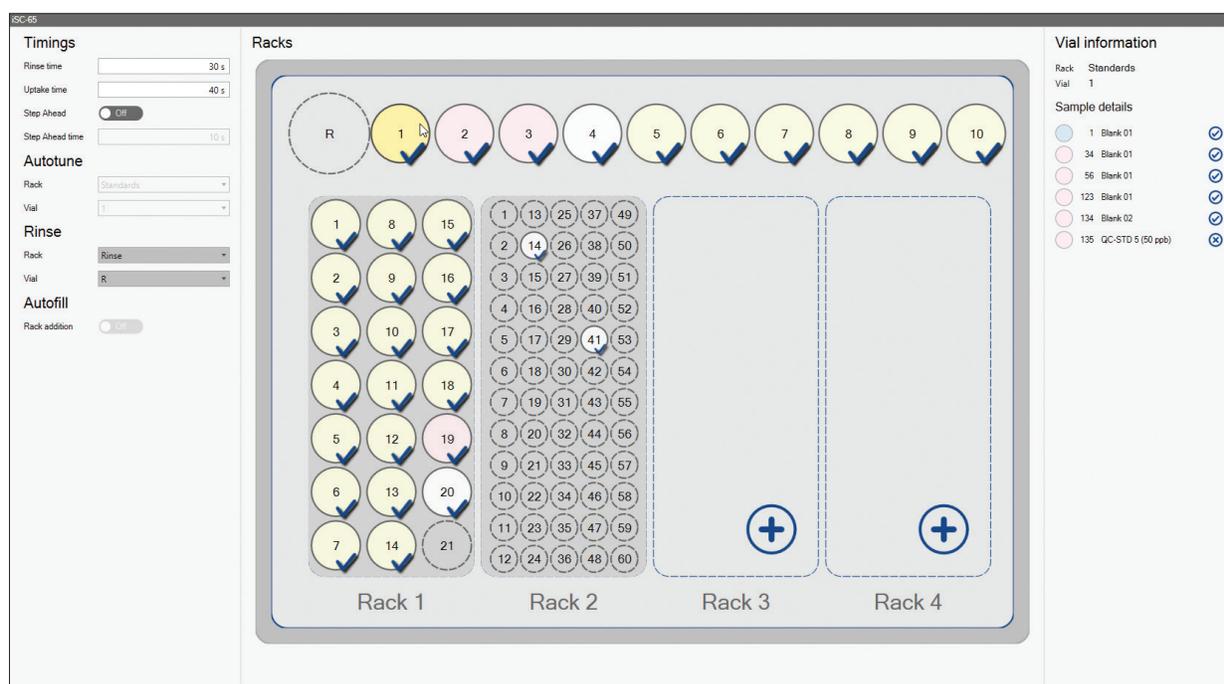


Figure 6. Analysis type specific color coding is carried through into the rack view of the iSC-65 LabBook for easier identification

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