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Release Notes

SII for Empower 1.2 • November 2021

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1 Introduction

Thermo Scientific™ Standard Instrument Integration (SII) for Empower™ is an interface driver for controlling Thermo Scientific chromatography instruments¹ within Waters™ Empower™ software.

SII for Empower is built on the modern Thermo Scientific™ Chromeleon™ 7 Chromatography Data System framework. It is meant to serve as a replacement for DII for Empower™ as this product is based on Chromeleon 6 technology which will shortly reach its end-of-life.

Due to its new technology, SII for Empower also greatly enhances the usability of the system via a modern UI for online instrument control and instrument method editing.

¹ See List of Supported Instruments for currently supported modules.

2 Abbreviations

The following abbreviations are used throughout this document. Further explanations can be found in the chapters of use.

SII	Thermo Scientific™ Standard Instrument Integration – Driver interface framework that allows control of supported Thermo Scientific™ chromatography modules under various software environments, using the Chromeleon 7 framework.
DII	Dionex Instrument Integration – Driver interface framework that allows control of supported Thermo Scientific™ chromatography modules under various software environments, using the Chromeleon 6.8 framework.
SWFR-xxxx	Chromeleon and SII for Empower software feature request tracking ID
xxxxxx	Chromeleon and SII for Empower issue tracking ID
LTSB	Long Term Support Branch (referring to releases of Windows Enterprise Operating Systems)
LAC/E	Laboratory Acquisition and Control / Environment
DAD	Diode array detector
PMT	Photo multiplier tube

3 Scope of this Document / Other Resources

The Release Notes describe the main features, list supported instruments and compatibility with Waters Empower and Windows operating systems for SII for Empower. If you require further information, for example, about installation, first steps, or troubleshooting, refer to one of the documents listed below.

List of Supported Instruments	Lists the instruments and modules that are supported with SII for Empower. Provides details of module specific limitations.
Installation Guide	Gives step-by-step instructions for installing and configuring Thermo Scientific SII for Empower, and describes all the requirements for installing SII for Empower (for example, PC and operating system requirements).
Quick Start Guide	Describes the basic operation of SII for Empower. Provides step-by-step instructions on how to control instruments and acquire data from HPLC and IC modules supported by SII for Empower via the Empower software.
SII for Empower Online Help	Provides information and help regarding the various options in SII for Empower which are specific to SII for Empower. Contains a section on troubleshooting helping to minimize the downtime of the instrument.
Certificate of Validation	Declaration that the product has been developed and tested according to the specification and appropriate standards.

Tip: The SII for Empower PDF documents are available on the SII for Empower installation disk in the folder Documents and also from the Windows start menu via Start -> Thermo SII for Empower -> Documents.

Chromeleon 7 Installation Guide	Components shared with Chromeleon 7 are automatically installed as part of the installation of SII for Empower, so no specific installation steps are required.
Chromeleon 7 Quick Start Guide	Describes the basic operation of Chromeleon 7. Functionality that is shared with SII for Empower is the Instrument Configuration Manager, the Instrument Method Wizard/Editor and the Instrument View.
Chromeleon 7 Online Help	Provides general information and help regarding the various options in SII for Empower which are shared with Chromeleon 7.

Tip: The Chromeleon 7 PDF documents are available from the Windows start menu via Start -> Thermo Chromeleon 7 -> Documents.

4 Product Features

SII for Empower 1.2 provides support for new chromatography instrumentation and improves on usability, features, and performance over Dionex Instrument Integration for Empower 1.16. The new modules/instruments and features are listed in this section.

SII for Empower replaces the former integration product DII for Empower and is recommended to be used for new installations. This ensures customers use the newest functionality and provides up to date integration into the existing IT infrastructure, e.g. Windows 10.

4.1 Drivers

All new modules are supported with Empower panels.

4.1.1 Thermo Scientific Vanquish Core – New Drivers [123730]

This release introduces support for the new Vanquish Core system. The following Vanquish Core instrument modules are supported:

- Vanquish Autosampler VC-A12-A
- Vanquish Autosampler VC-A13-A
- Vanquish Column Compartment VC-C10-A
- Vanquish Binary Pump VC-P10-A
- Vanquish Quaternary Pump VC-P20-A
- Vanquish Quaternary Pump VC-P21-A
- Vanquish Diode Array Detector VC-D11-A
- Vanquish Fluorescence Detector VC-D50-A
- Vanquish Fluorescence Detector VC-D51-A
- Vanquish Isocratic Pump VC-P40-A
- Vanquish Variable Wavelength Detector VC-D40-A
- Vanquish Dual Pump VC-P32-A
- Vanquish Dual Pump VC-P33-A
- Vanquish Multiple Wavelength Detector VC-D12-A

Vanquish Core modules require a minimum firmware version 2.01.

Note: The Vanquish Charger is only supported with Vanquish Autosamplers with temperature control. The Vanquish Core Autosampler VC-A13-A does not allow to configure a charger.

Note: The Vanquish Core modules may only be used with Empower 3 Feature Release 5 or later versions

4.1.2 Thermo Scientific Vanquish Solvent Monitor – New Driver [123730]

This release introduces support for the new Vanquish Solvent Monitor (VSM). The VSM allows monitoring solvent levels (or waste levels) on four or eight channels.

Note: The Vanquish Solvent Monitor may only be used with Empower 3 Feature Release 5 or later versions

Note: This module is not yet supported with a Panel in Empower. The user should use the launch instrument view item on the context menu of any other module to access the Chromeleon Panels for the Solvent Monitor.

Note: As SII for Empower doesn't have a sequence context, this module can only be used to monitor the amount of solvent in a vessel, and not determine whether this is enough for the proposed sequence.

4.1.3 TRACE 1300 GC Instrument [122128]

This release enhances the support for the TRACE 1300/1310 GC to allow two AI/AS 1310 autosamplers to be connected via the GC, using the two COM ports on the rear of the GC.

4.1.4 TriPlus Autosamplers [117329, 117525]

This release adds support for the TriPlus 100 LS, TriPlus RSH, and updates support for the TriPlus 500 HS autosamplers.

Note: The TriPlus 100 LS and TriPlus RSH modules may only be used with Empower 3 Feature Release 5 or later versions

4.1.5 Thermo Scientific Aquion and Aquion RFIC [123732]

This release introduces support for the Thermo Scientific Aquion and Aquion RFIC.

Note: This module is not yet supported with a Panel in Empower. The user should use the launch instrument view item on the context menu available with a right mouse click in the area where the panels would normally appear in Empower.

Note: The Aquion and Aquion RFIC may only be used with Empower 3 Feature Release 5 or later versions

4.1.6 Instrument Method Translation for UltiMate 3000 to Vanquish [123730]

The Instrument Method Translation Wizard facilitates the translation of instrument methods when assigning an existing instrument method to a different instrument. The Instrument Method Translation Wizard shows module correlations between devices in the source and target instrument. Mapping conflicts are highlighted and can be resolved using the translation tool.

Note: It is not possible to use the "Adjust Manually" functionality in SII for Empower

4.1.7 Vanquish: Method Transfer [123730]

This release introduces Method Transfer capabilities to transfer an instrument method from e.g., an UltiMate 3000 system to a Vanquish system. For the Vanquish Core instrument, Chromeleon allows modifying the Gradient Delay Volume (GDV) via the metering device. In addition, if a larger GDV adjustment is required, the installation of a Method Transfer Kit extends this range by the volume of an additional capillary which is configured for the column compartment.

Note: Running an instrument method with Method Transfer activated leaves the system in a state with modified GDV. To afterwards run a method without the Method Transfer option, the idle volume of the sampler must be manually reset to its normal value.

4.1.8 Vanquish Core Diagnostics [123730]

This release introduces Diagnostics for the Vanquish Core system. Chromeleon provides a number of diagnostic tests for Vanquish Core instruments: Basic Tightness Test, Intensity Test, Shutter Motor Test, and Grating Motor Test. The results are recorded in the Empower message centre.

4.1.9 Vanquish Autosampler – Updated Driver [123730]

This release introduces some changes in the Vanquish Autosampler driver as follows:

Support for 4ml and 10 ml Vials

Automated purging via Sampler for the Vanquish Flex Autosamplers

User Defined Programs (UDPs) for the Vanquish Horizon and Vanquish Flex Autosamplers. User Defined Programs allow customizing sampling or sample preparing actions

Note: This feature (UDP) is not available for Vanquish Duo Autosamplers.

Note: The “monitor” functionality in Empower cannot be used if the instrument method contains UDPs.

4.2 General

4.2.1 Block usage of manual commands while sequence is running [123221]

SII for Empower 1.2 introduces a new security feature which prevents any manual action (e.g. changing an instrument setpoint) being performed on instruments controlled through SII for Empower while a sequence is running.

4.2.2 Allow use of Smart Standby and Shutdown [131083]

SII for Empower 1.2 allows the user to configure the usage of Smart Standby or Shutdown after the current queue. This should be configured initially in the Instrument Configuration Manager and can then be set as desired per queue via the Empower Link mini panel. The parameters are set from the Instrument Method Editor.

Note: Although the Smart Startup tab appears in the Instrument Method Editor, this has **not** been validated for use and is thus not supported at this time as it cannot be guaranteed to work.

4.3 Compatibility

4.3.1 Waters Empower [CM-10711]

Version 1.2 of SII for Empower has been validated for use with the following versions of Waters Empower 3:

- Feature Release 4 on Windows 10
- Service Release 3 on Windows 10
- Feature Release 5 on Windows 10
- Service Release 4 on Windows 10
- Service Release 5 on Windows 10
- Empower 3.6.0
- Empower 3.6.1

It supports all Empower installation types, i.e. Empower Personal Workstation, Empower Workgroup and Enterprise client/server.

When migrating from DII for Empower to SII for Empower it is suggested to keep an independent installation of DII for Empower for full reporting functionality. While reports on chromatographic results previously gathered with DII for Empower can still be retrieved, some reporting functionality (e.g. instrument method content) is limited.

4.3.2 Chromeleon 7 [CM-10711]

Version 1.2 of SII for Empower is based on Chromeleon 7.3 technology.

4.3.3 Microsoft Windows [CM-17037]

Version 1.2 of SII for Empower is compatible with Windows 10 Build 1803 and 1809 (Pro + Enterprise x64 English), Windows Server 2012 R2 (x64 English), and Windows Server 2016 (x64 English).

4.3.4 Citrix XenApp [28350]

Version 1.2 of SII for Empower has been tested and validated to be compatible with Citrix XenApp 7.6 installed on Windows Server 2012 R2 (x64 English) for Empower 3 FR4 and Citrix XenApp 7.15 installed on Windows Server 2016 (x64 English) from Empower 3 FR5.

4.3.5 LAC/E box [63141]

Version 1.2 of SII for Empower has been tested and validated to be compatible with the following models of LAC/e box:

- eLAC/E 16 on Windows 10 Enterprise 2016 LTSB x64
- cLAC/E 16 on Windows 10 Enterprise 2016 LTSB x64

4.3.6 Non-English Empower

Version 1.1 of SII for Empower has been tested and validated to be compatible with the following non-English language versions of Empower:

- Empower 3 Japanese edition [52683]
- Empower 3 Chinese version

5 Resolved Issues

This chapter describes all issues that have been resolved with the release of SII for Empower. If an issue is not listed here, it has not been resolved with this software update.

The numbers in the first column of the table below refer to the Thermo Fisher Scientific tracking IDs.

ID	Description
52242 52903	<p>Using a Vanquish Autosampler with Charger in some SII environments it was not possible to run a sequence or add a SmartShutdown method because of a driver message "SamplerModule There is a rack in the 'Yellow' segment. This position is reserved for charger rack transfer and must be left empty when a sequence is started. Remove this rack manually, then close the door. If the error persists, use the 'Reset' command." This driver message was shown when the SmartShutdown was about to start or between two injections.</p> <p>This is caused by a new mode in the Vanquish Autosampler driver, which is trying to detect if it's working in an SII environment, which reports a sequence as a succession of single injections to the Autosampler driver. This mode was introduced to avoid moving a rack back to the charger prematurely because the driver interprets the single injection as the last injection of a sequence. The delay to the rack movement introduced by this mode may be too short for some applications.</p> <p>Now the user can configure the delay time the driver waits after the end of a run and before it moves back the rack to the charger. In the configuration dialog for the Vanquish Autosampler, on the "Links" tab, the "SII Environment Settings" allow setting a time interval for the delay of the removal of the rack. The default setting is 10 s. The user can increase the delay to up to 1 hr (3600 s). For Vanquish Autosampler configurations that have been created with a Chromeleon version earlier than Chromeleon 7.3, the value cannot be changed and the default value (10 s) is used</p>
117325	SII For Empower: Data points could be repeated if "Setup" had been used prior to acquisition. In particular, this could lead to problems when using Apex Tracking to evaluate data.
128642	Thermo Scientific TriPlus 500: Carrier control and Transfer Line properties were missing in the mini-panel.
131090	When using the method set editor in Empower, it was not possible to select the channel directly in the method

6 Known Limitations

Currently, Thermo Scientific Standard Instrument Integration for Empower version 1.2 has the following limitations:

6.1 Instrument Control

The SII for Empower workstation must be in the domain and have access to the DNS, and the user working with the client component must be a domain user. Without domain name resolution, the Instrument View will take very long (several minutes) to launch.

Internal reference: [54161]

6.1.1 Configuring Trays (Plate Types)

The layout of your HPLC autosampler and the location of your samples must be defined in Empower. This requires the operator to select plate types or trays used in the autosampler for sample injection. The plate type defines both the overall plate dimensions and the number and dimensions of the sample wells the plate contains. Currently, Thermo Scientific Standard Instrument Integration for Empower cannot automatically add the different Thermo Scientific autosampler trays to the list of Plate Types in Empower. Instructions describing how to manually configure the plates/trays are provided in the SII for Empower help and Quick Start Guide.

Note: Once you create plate types, they are available to all projects.

Note: 10 and 22 Prep Vial trays are currently not supported.

Note: 10 ml Poly Vials are currently not supported.

6.1.2 Missing vials with AI/AS1300

In Chromeleon, the AI/AS1310 has two options for handling missing vials: "Abort Sequence", "Skip injection, continue sequence". By design, when the AI/AS1300 is controlled by SII for Empower, the skip option is not supported, and therefore all missing vials will cause acquisition of the current sequence to be aborted.

Internal reference: [62012]

6.1.3 Integrion HPIC Consumables rescan

When using an Integrion HPIC with SII for Empower 1.2, the re-scan button doesn't work for RFID enabled consumables. This then prevents any injections being run on the Integrion. As a workaround, it is necessary to restart instrument controller or reconfigure the module.

Internal reference: [167921]

6.1.4 Spurious warning in Message Centre

If the user creates a new instrument method with SII for Empower using default values, selects the method, and then clicks on the "Setup" button, the message centre will show the spurious warning: "Device = 'SamplerModule.Sampler': Missing Inject command."

Internal reference: [47645]

6.1.5 Other Module-specific Limitations

For limitations specific to a module please refer to the List of Supported Instruments.

6.2 Data Acquisition and Storage

6.2.1 Instrument Methods

Avoid using the 'Remove Equilibration Stage' button on the pump gradient page of the Instrument Method Editor. Methods without this stage will fail when executing Monitor Baseline and/or Setup Method. More details are available in the online help.

6.2.2 Empty instrument method

If the user starts to create an instrument method, and immediately saves this (empty) method, attempted usage of this method via the Run Samples and Setup workflow, a warning message will appear in the message centre stating: "Value cannot be null. Parameter name: s"

Internal reference: [47960]

6.2.3 Single Module Support

When operating the Corona Veo alongside Acquity modules some controls in the Instrument Method Editor will not be shown – thus leading to all channels being acquired.

Internal reference: [35679]

6.2.4 Monitor Baseline/Setup Method

During Monitor Baseline, 3D data are not acquired.

6.2.5 Monitor Baseline

If the user begins acquisition without first stopping the monitor baseline function, the error message "Stopped the sequence queue run" can be seen in the message centre.

6.2.6 TRACE 1300 GC Monitor Baseline

It is not possible to monitor the baseline when using a TRACE 1300 GC instrument.

Internal reference: [61874]

6.2.7 Sample Functions

The Empower sample functions 'Equilibrate', 'Condition Column', 'Inject Immediate Standards' and 'Inject Immediate Samples' must not be used when using an SII Detector configuration, for example a Thermo Scientific Corona Veo in combination with a Waters HPLC. More details are available in the online help.

6.2.8 Abort after sample

If using "abort after injection completed" in combination with "Continue with next sample set" the message "System Idle – User Abort" does not appear although expected by Empower users.

6.2.9 Non-Inject Functions

When using the non-inject functions (Monitor, Equilibrate etc) the warning message "Device='SamplerModule.Sampler': Missing inject command can be seen in the message centre.

6.2.10 TRACE 1300 GC Shutdown Method not Downloaded

If using a shutdown method for a TRACE 1300 GC combined with a TriPlus 500 Autosampler, this will not be downloaded to the instrument.

Internal reference: [66246]

6.2.11 Error after running Shutdown Method

If you run a sequence with a shutdown method at the end, the shutdown method parameters get sent to the instrument, but the Status of the modules (in the mini-panels) go to Error, and the Message Center shows Error messages.

Internal reference: [63013]

6.3 Non-English language versions of Empower

6.3.1 Error when reviewing data on non-English Empower/Windows 10 [64436]

When data is reviewed in Empower by double-clicking, pressing review button, or right-click and selecting review on the channel data or result data, an error message is raised. The message, in Japanese/Chinese characters, says "Failed to start application (Review)".

The error is caused by an issue in the Waters Empower application and can be worked-around in one of the following ways:

- Double-click while holding down the "SHIFT" key, the error will not occur and the data will open normally
- Using the "QuickStart" mode instead of "Professional" mode will open the data without the error
- Follow the steps described by Waters at https://support.waters.com/KB_Info/Empower/Breeze/WKB66934_Empower_ErrorFailed_to_start_application_Review

6.4 Autozero Delay with ICS-5000 [141579]

When collecting data using SII for Empower with an ICS 5000 with the Autozero setting, there is a delay of approximately 0.3s between the start of data acquisition and the autozero being applied.

6.5 Multiple Injections per line [162854]

It is not possible to use multiple injections per line in a sample set when a Corona Veo is configured and attached to a non-Thermo Scientific LC system and configured as an SII detector. The workaround is to use a new line for each injection. This functions correctly when a full Thermo Scientific system is used.

6.6 Method Import from DII for Empower

SII for Empower does not provide means for importing instrument methods which were created with DII for Empower.

6.7 Instrument IQ and OQ

The instrument IQ and OQ for modules controlled through SII cannot be done within Waters Empower.

For an SII System (all modules controlled within SII) the instrument IQ/OQ can be executed within Chromeleon. A Chromeleon installation and license is needed.

For an SII Detector (a single module controlled within SII), instrument IQ/OQ is not supported.

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