

LabSolutions

HS-20 Control Software

Instruction Manual

Read this manual thoroughly before you use the product.
Keep this manual for future reference.

This page is intentionally left blank.

Introduction

Read this Instruction Manual thoroughly before using the product.

Thank you for purchasing Shimadzu analytical instrument workstation “LabSolutions HS-20 Control Software” (hereafter referred to as “the software”).

This software is for controlling the HS-20 unit in the LabSolutions system.

Installing this software allows you to develop methods for controlling the HS-20 unit or to control it from the LabSolutions.

The operating requirements for the PC are the same with those for LabSolutions.

This manual describes the procedures for operating this product. Read this manual thoroughly before using the product and operate the product in accordance with the instructions in this manual.

Also, keep this manual for future reference.

This manual assumes that the reader is knowledgeable of basic operations of Windows. For the operation of Windows, refer to the instruction manual that comes with that product.

Important

- If the user or installation location changes, ensure that this Instruction Manual is transferred with the product.
- If this manual is lost or damaged, immediately contact your Shimadzu representative to request a replacement.
- To ensure safe operation, contact your Shimadzu representative for product installation, adjustment, or reinstallation (after the product is moved).



Notice

- Information in this manual is subject to change without notice and does not represent a commitment on the part of the vendor.
- Any errors or omissions which may have occurred in this manual despite the utmost care taken in its production will be corrected as soon as possible, although not necessarily immediately after detection.
- All rights are reserved, including those to reproduce this manual or parts thereof in any form without written permission from Shimadzu Corporation.
- Microsoft, Windows and Windows Vista are registered trademarks of Microsoft Corporation in the United States and/or other countries. Adobe, Adobe logo and Adobe Reader are trademarks or registered trademarks of Adobe Systems Incorporated in the United States and/or other countries. Other company names and product names mentioned in this manual are trademarks or registered trademarks of their respective companies. The TM and ® symbols are omitted in this manual.
- Replacement parts for this product will be available for a period of seven (7) years after the product is discontinued. Thereafter, such parts may cease to be available.

Note, however, that the availability of parts not manufactured by Shimadzu shall be determined by the relevant manufacturers.

Indications Used in Instruction Manuals

Cautions and Notes are indicated using the following conventions, and the following symbols are used in this manual:

Indication	Meaning
 NOTE	Emphasizes additional information that is provided to ensure the proper use of this product.
 Reference	Indicates the location of related reference information.
[]	Indicates the names of buttons, menu options, setting options, windows/sub-windows, and icons that are displayed in a window. Example: Click [OK].

Warranty

Shimadzu provides the following warranty for this product.

1. Period

Please contact your Shimadzu representative for information about the period of this warranty.

2. Description

If a product/part failure occurs for reasons attributable to Shimadzu during the warranty period, Shimadzu will repair or replace the product/part free of charge (including USB dongles). However, in the case of products which are usually available on the market only for a short time, such as personal computers and their peripherals/parts, Shimadzu may not be able to provide identical replacement products.

3. Limitation of Liability

- (1) In no event will Shimadzu be liable for any lost revenue, profit or data, or for special, indirect, consequential, incidental or punitive damages, however caused regardless of the theory of liability, arising out of or related to the use of or inability to use the product, even if Shimadzu has been advised of the possibility of such damage.
- (2) In no event will Shimadzu's liability to you, whether in contract, tort (including negligence), or otherwise, exceed the amount you paid for the product.

4. Exceptions

Failures caused by the following are excluded from the warranty, even if they occur during the warranty period.

- (1) Improper product handling
- (2) Repairs or modifications performed by parties other than Shimadzu or Shimadzu designated companies
- (3) Product use in combination with hardware or software other than that designated by Shimadzu
- (4) Computer viruses leading to device failures and damage to data and software, including the product's basic software
- (5) Power failures, including power outages and sudden voltage drops, leading to device failures and damage to data and software, including the product's basic software
- (6) Turning OFF the product without following the proper shutdown procedure leading to device failures and damage to data and software, including the product's basic software
- (7) Reasons unrelated to the product itself
- (8) Product use in harsh environments, such as those subject to high temperatures or humidity levels, corrosive gases, or strong vibrations
- (9) Fires, earthquakes, or any other act of nature, contamination by radioactive or hazardous substances, or any other force majeure event, including wars, riots, and crimes
- (10) Product movement or transportation after installation
- (11) Consumable items

Note: Recording media such as floppy disks, CD-ROMs and DVD-ROMs are considered consumable items.

- * If there is a document such as a warranty provided with the product, or there is a separate contract agreed upon that includes warranty conditions, the provisions of those documents shall apply.

Warranty periods for products with special specifications and systems are provided separately. The license cannot be reissued if you lose the USB dongle or license certificate provided with the product.

Contents

Introduction

Indications Used in Instruction Manuals	iii
Warranty	iv

1 Installation

1.1 Confirmation of parts	1
1.2 Notes of Installing	1
1.3 Connection	1
1.4 Software System Configuration	2

2 Operations

2.1 Method Development	9
2.1.1 Edit Method File	9
2.1.2 Parameters	11
2.2 Batch Processing	14
2.2.1 Preparing the batch table	14
2.2.2 Parameters (for HS only)	15
2.2.3 Precautions on batch table preparation	16
2.2.4 Starting the batch table	16
2.2.5 Running multiple batch files sequentially	17
2.3 Display the Pre-treatment Result	18

1 Installation

1.1 Confirmation of parts

Please confirm that the following parts are contained:

- LabSolutions HS-20 Software
License certificate or USB Dongle 1
LabSolutions HS-20 control software instruction manual
- Start signal cable, READY signal cable and USB cable (attached to HS-20)

1.2 Notes of Installing

For installing the HS-20 main unit, refer to the instruction manual for the main unit.

The communications between the PC and HS-20 are carried out via USB cable. You can use any USB port for communications; however, you are required to specify the Serial Number in the HS Communication Settings dialog box under the Instrument system configuration.

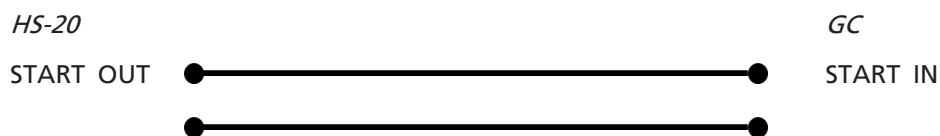
1.3 Connection

▶▶ **Reference** Refer to the instruction manual of the HS-20 main unit for details.

1

Connect the start signal cable.

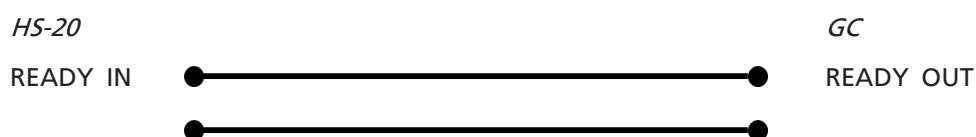
Before connecting this cable, power switch to both the HS main unit and the GC must be turned off.



2

Connect the ready signal cable.

Before connecting this cable, power switch to both the HS main unit and the GC must be turned off.



3 Connect the USB cable between HS-20 and PC.


4 Turn ON the power and confirm that it starts correctly.

1.4 Software System Configuration

Registering the HS-20 enables analysis using the unit.

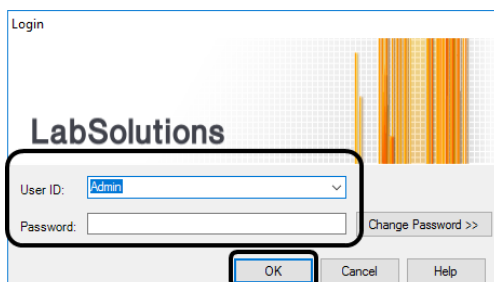
1 Turn each instrument on.

2 Turn the PC on, and start Windows.


3 Double-click the  (LabSolutions) icon displayed on the Windows Desktop.

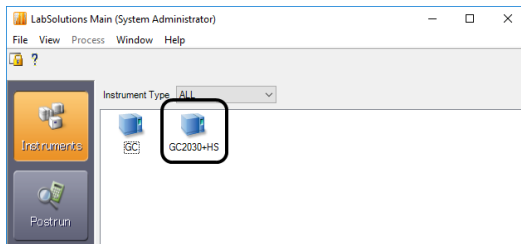


4 Enter "Admin" at [User ID], and click [OK].



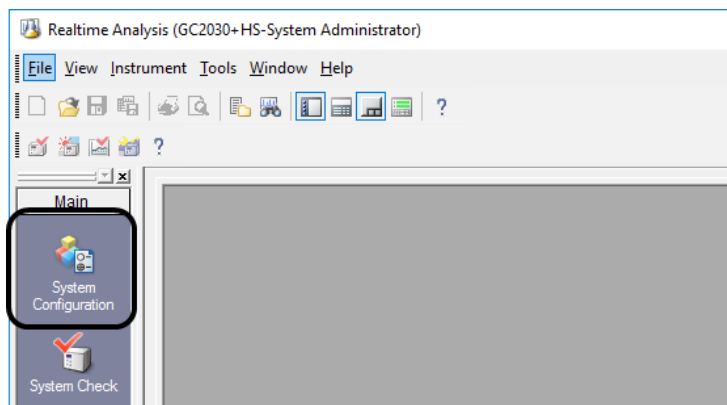
5

Click the  (Instruments) icon, and double-click the icon of the instrument to use.




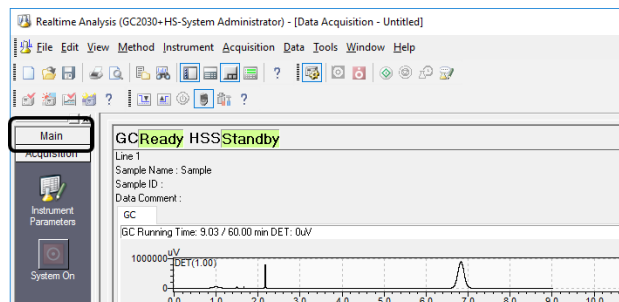
6

Click the  (System Configuration) icon on the [Main] assistant bar.



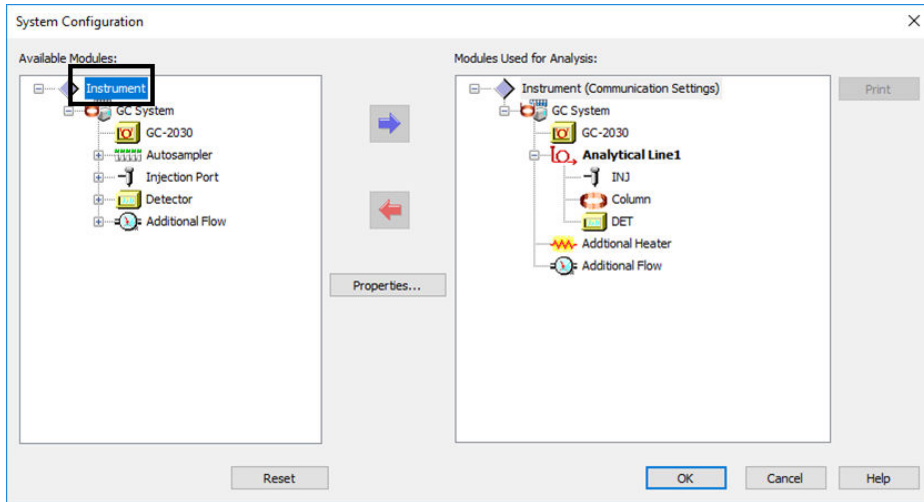
NOTE

If the  (System Configuration) icon is not displayed, click on the title of the assistant bar.



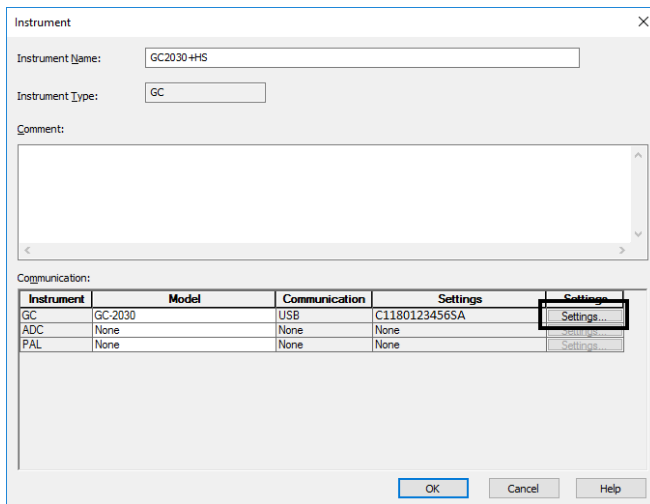
7

Double-click the [Instrument] icon at [Available Modules].



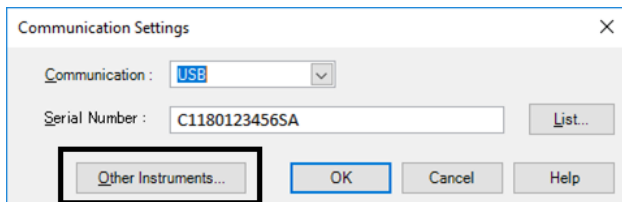
8

Click the [Settings] on [Communication].



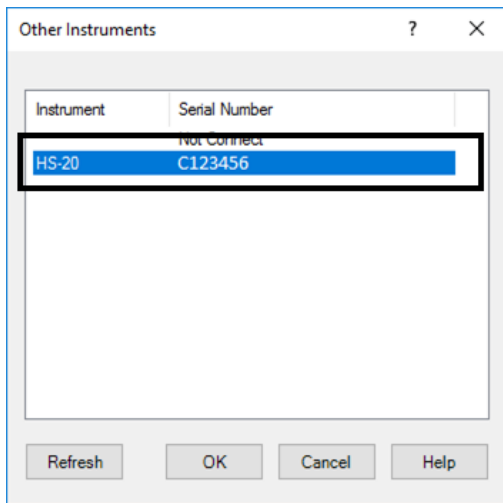
9

Click the [Other Instruments].

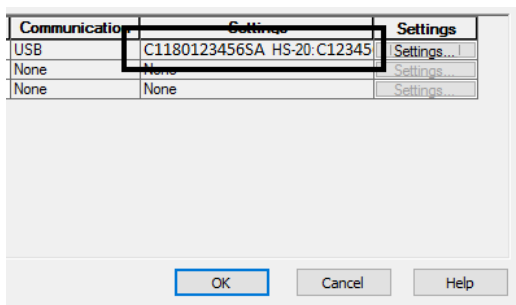


NOTE [Other Instruments] is available, if the License for HS is valid.

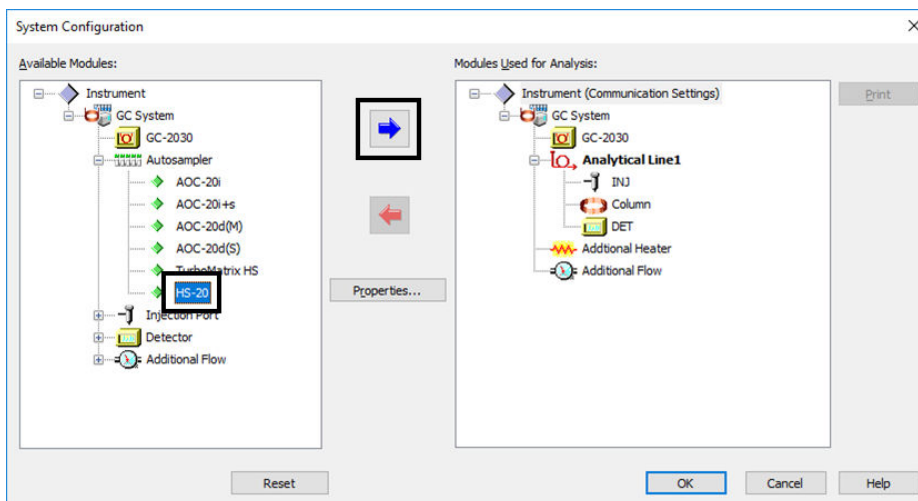
10 Select HS-20 Serial Number you use in the [Serial #] list, and click [OK].



Serial number of HS-20 you select is appeared on [Settings] at [Communication], and [HS-20] icon is added to [Available Modules] at [System Configuration].



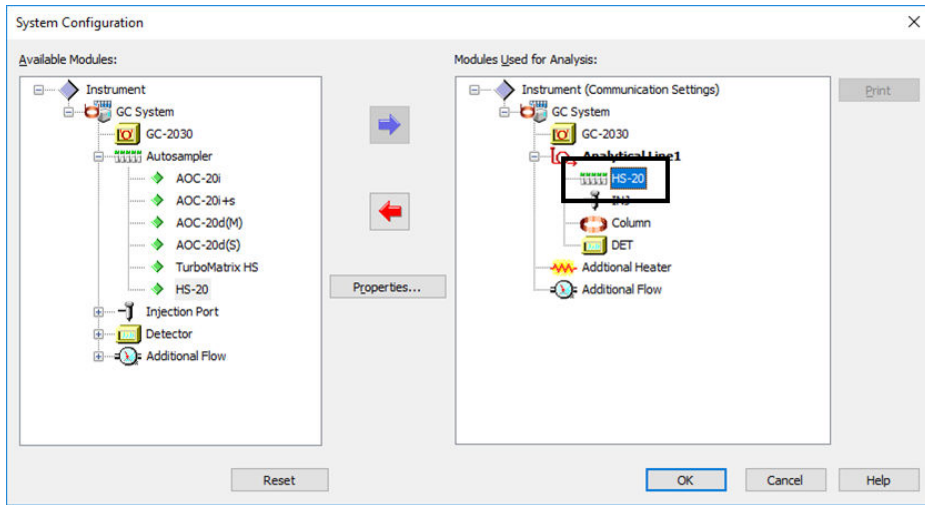
11 Select [HS-20] in the [Autosampler] list at [Available Modules], and click .



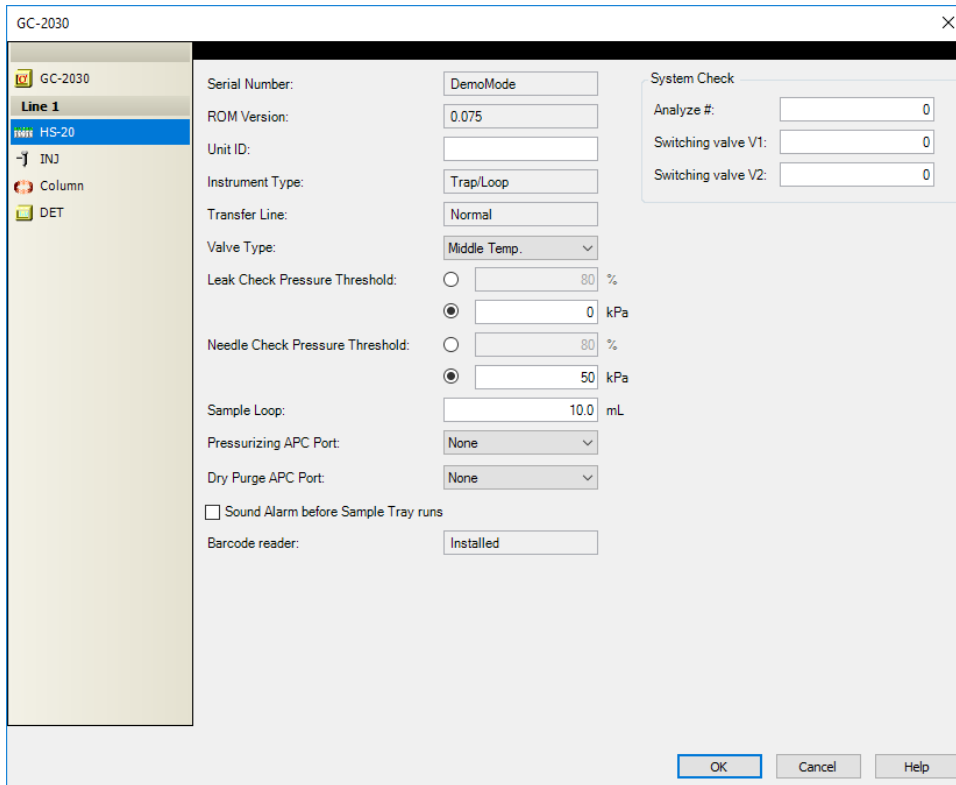
[HS-20] is added to [Modules Used for Analysis].

12

Double-click the [HS-20] icon at [Modules Used for Analysis].



13 Configure for HS-20 on [HS-20] Tab of [Analytical Line].



The Information of Serial Number, ROM Version, Instrument Type, Transfer Line, Valve type and Barcord Reader are sent from HS-20 and displayed. And then, configure following parameters.

NOTE There are items that cannot be displayed depending on options.

Parameters	Description	Setting Range (unit)	Default
Unit ID	The instrument name or ID can be entered. The instrument name set here can be output to the system configuration report	Max. 15 characters	Blank
Leak Check Pressure Threshold	Sets the threshold value to determine whether the pressure profile value measured during pressurizing the vial is normal or not. If the pressure profile value during vial pressurization is less than either the pressurization pressure multiplied by the setting value (when set to [Ratio]) or the pressure setting value (when set to [Absolute Value]), it is judged to be an error.	Ratio, Absolute Value	Ratio
	(Ratio) Sets the threshold by ratio.	0 ~ 100(%)	80
	(Absolute Value) Sets the threshold by absolute value.	0 ~ 600(kPa)	0

Parameters	Description	Setting Range (unit)	Default	
Needle Check Pressure Threshold	Sets the threshold value to determine whether the pressure profile value measured during needle flushing is normal or not. If the pressure profile value during needle flushing is greater than either the pressurization pressure multiplied by the setting value (when set to [Ratio]) or the pressure setting value (when set to [Absolute Value]), it is judged to be an error.	Ratio, Absolute Value	Ratio	
	(Ratio)	Sets the threshold by ratio.	0 ~ 100(%)	80
	(Absolute Value)	Sets the threshold by absolute value.	0 ~ 600(kPa)	50
Sample Loop	Set the volume of sample loop.	0.0 ~ 6000.0(mL)	10.0	
Pressurizing APC Port	Set the GC additional flow port No. for pressurizing.	None, (APC Port of GC Additional Flow)	None	
Dry Purge APC Port	Set the GC additional flow port No. for pressurizing at Dry Purge.	None, (APC Port of GC Additional Flow)	None	
Sound Alarm before Sample Tray runs	Set this on if sounding alarm before Sample tray running	On, Off	Off	
Overlap	Set this option to [Yes] to overlap the pretreatment system with HS-20. Selecting [No] makes available some functions such as pausing during a no-injection analysis or batch analysis.	Yes, No	Yes	
System Check	Sets the check criteria when checking (system check) the HS-20 analysis time and durable consumables (valve).	-	-	
Analysis #	Set the threshold for alarm of HS-20 Analysis time.	0 ~ 999999	0	
Switching Valve V1	Set the threshold for usage of Switching Valve V1.	0 ~ 999999	0	
Switching Valve V2	Set the threshold for usage of Switching Valve V2.	0 ~ 999999	0	

- NOTE**
- For GC-2010 or GC-2014, set [System Check] items in the window displayed when clicking the [System Check] button.
 - When Additional Flow is installed in GC, make sure to set [Pressurizing APC Port] and [Dry Purge APC Port].
 - If the pressure profile value at the time of needle flushing is determined to be abnormal, the needle is judged to be clogged and the analysis is suspended.
 - Whether a needle clog error has occurred or not can be checked in LabSolutions Log Browser.


2 Operations

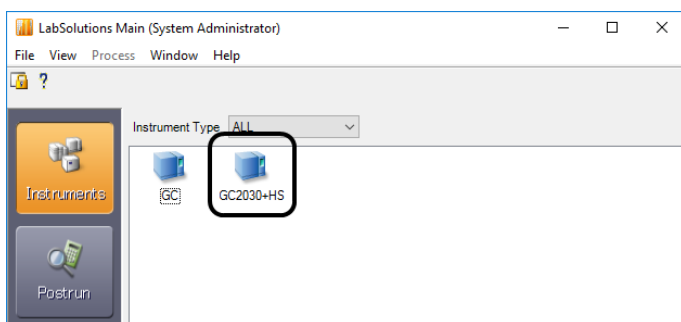
2.1 Method Development

2.1.1 Edit Method File

Set the control conditions for the HS in the [Instrument Parameter] view.

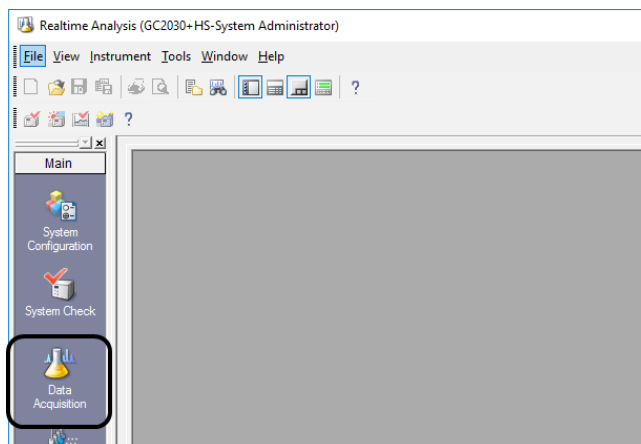
1


Click the  (Instruments) icon, and double-click the icon of the instrument to use.

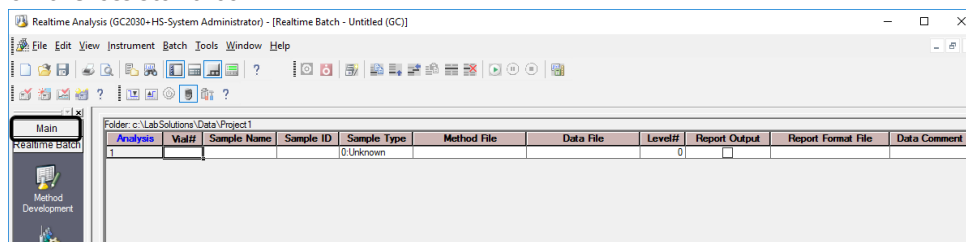


2

Click the  (Data Acquisition) icon on the [Main] assistant bar.



NOTE If the  (Data Acquisition) icon is not displayed, click on the title of the assistant bar.

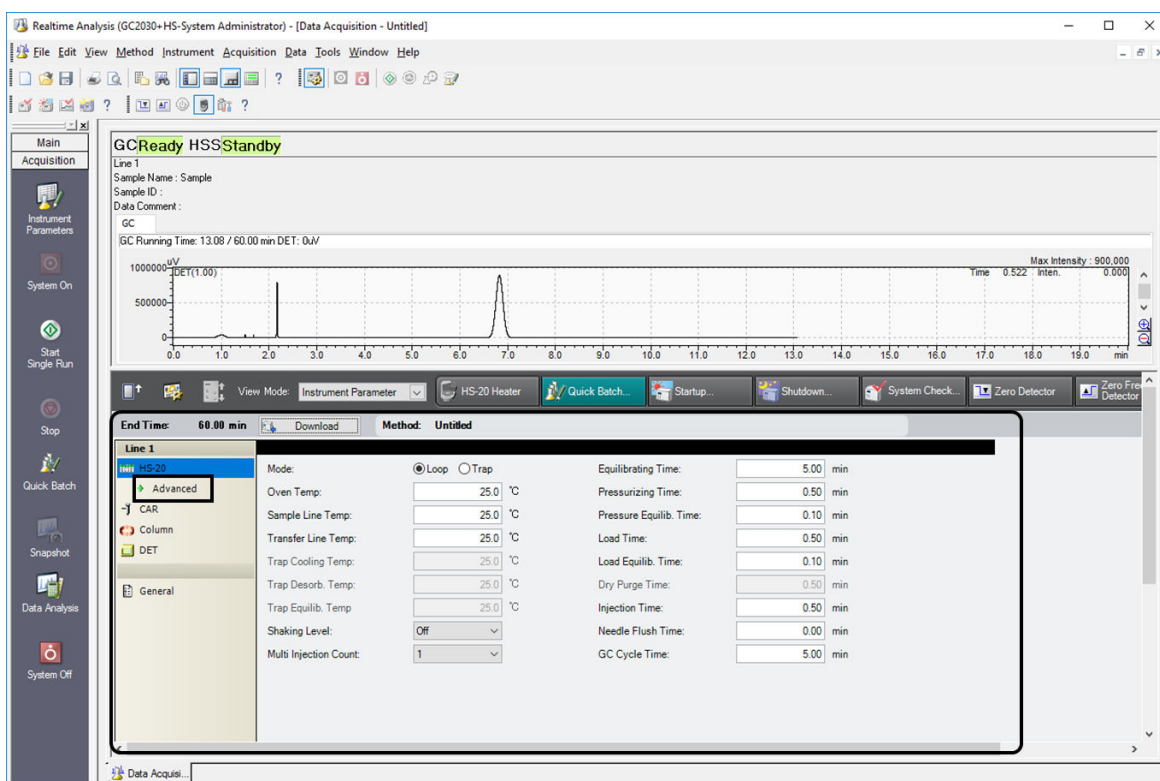


3

Set the analysis conditions for the HS-20 on the [HS-20] tab in [Instrument Parameter View], and then click [Advanced].

▶▶ Reference If the [HS-20] tab is not displayed in [Instrument Parameter View], refer to "1.4 Software System Configuration" P.2.

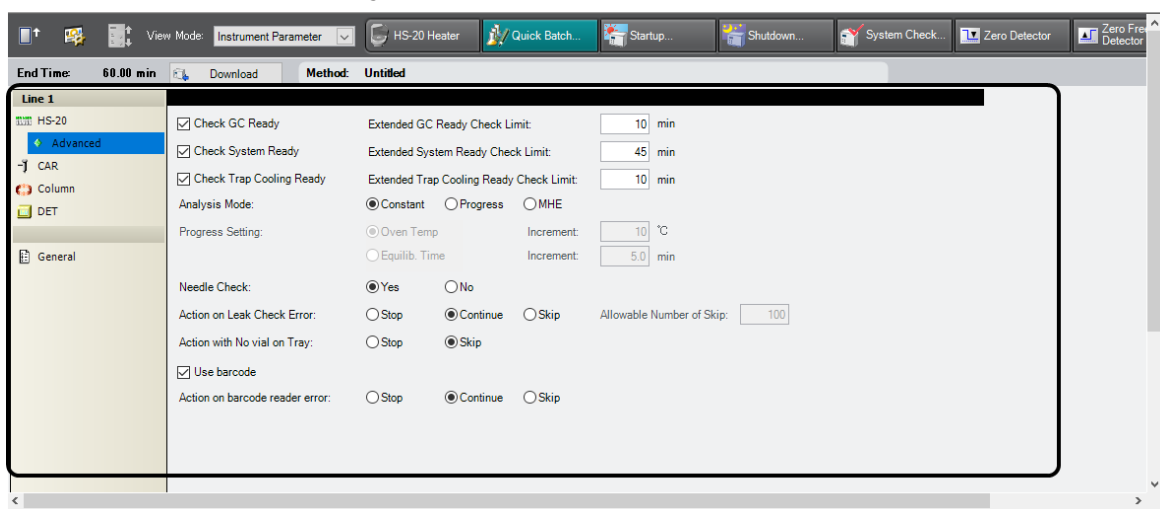
- NOTE
- There are items that cannot be displayed depending on options.
 - For GC-2010 or GC-2014, click [Details] button.



If Clicked [Advanced], [HS-20 Detail] is displayed.

4

Set the HS-20 detail analysis conditions.



2.1.2 Parameters

■ HS-20 Parameters

Parameter	Description	Setting Range (Unit)	Default
Mode	Set the HS-20 Mode.	Loop, Trap	Loop
Oven Temp.	Set the HS-20 Oven temperature.	0.0 ~ 300.0 (°C)	25.0
Sample Line Temp.	Set the HS-20 Sample Line temperature.	[Middle Temp.] 0.0 ~ 220.0 (°C) [High Temp.] 150.0 ~ 300.0 (°C)	[Middle Temp.] 25.0 [High Temp.] 150.0
Transfer Line Temp.	Set the HS-20 Transfer Line temperature.	[Regular] 0.0 ~ 350.0 (°C) [Long] 0.0 ~ 200.0 (°C)	25.0
Trap Cooling Temp.	Set the HS-20 Trap temperature for Cooling.	[Sample Line Temp.: ~ 149.9 °C] -30.0 ~ 80.0 (°C) [Sample Line Temp.: 150.0 ~ 249.9 °C] -20.0 ~ 80.0 (°C) [Sample Line Temp.: 250.0 °C ~] -10.0 ~ 80.0 (°C)	25.0
Trap Desorb. Temp.	Set the HS-20 Trap temperature for Desorption.	0.0 ~ 350.0 (°C)	25.0
Trap Equilib. Temp.	Set the HS-20 Trap temperature for Equilibration.	-30.0 ~ 80.0 (°C) [HS-20 ROM version is 2.00 or later] -30.0 ~ 140.0 (°C)	25.0
Shaking Level	Shaking Level Set the vial shaking level for gas-liquid / solid- gas equilibrium of vial.	Off, 1 ~ 5	Off
Multi Injection Count	Set the MHI (Multiple Head Injection) count.	1 ~ 10	1
Pressurize Gas Pressure	Set the Gas Pressure for vial pressurizing.	[kPa] 0.0 ~ 970.0 [bar] 0.00 ~ 9.70 [psi] 0.0 ~ 140.0	[kPa] 50.0 [bar] 0.50 [psi] 7.3
Dry Purge Gas Pressure	Set the Gas Pressure for Dry Purge.	[kPa] 0.0 ~ 970.0 [bar] 0.00 ~ 9.70 [psi] 0.0 ~ 140.0	[kPa] 50.0 [bar] 0.50 [psi] 7.3
Equilibrating Time.	Set the time for equilibrate vials.	0.00 ~ 999.99(min)	5.00
Pressurizing Time.	Set the time for pressurizing vials.	0.00 ~ 9.99(min)	0.50

Paramteres	Description	Setting Range (Unit)	Default
Pressure Equilib.Time	Set the time for leak check after pressurizing vials.	0.00 ~ 9.99(min)	0.10
Load Time	Set the time for loading sample at the Loop / Trap.	0.00 ~ 9.99(min)	0.50
Load Equilib. Time	Set the time for equilibration after loading sample.	0.00 ~ 9.99(min)	0.10
Drt Purge Time	Set the time for drying sample at the trap.	0.00 ~ 99.99(min)	0.50
Injection Time	Set the time for Injecting sample to GC.	0.00 ~ 999.99(min)	0.50
Needle Flush Time	Set the time for flushing sample in the needle.	0.00 ~ 99.99(min)	0.00
GC Cycle Time	Set the time from injecting sample to next sample injection.	0.00 ~ 999.99(min)	5.00

- NOTE**
- For GC Cycle Time, set a time longer than the total time of GC Analysis Time plus Cooling Time. Cooling time should be about 10 minutes when the initial temperature is 50 °C or higher and about 15 minutes when less than 50 °C.
In cases where your system has no gradient program for column oven or incorporates a cooling program, there is no need to worry about cooling time.
 - The unit of pressure follows the <Configuration> - <GC> - <General> settings.

■ HS-20 Detail Parameters


Parameters	Description	Setting Range (Unit)	Default
Check System Ready	Set whether or not check the HS-20 system Ready.	On, Off	On
Extended System Ready Check Limit	Set the extra time for System Ready check when the check doesn't pass.	1 ~ 60(min) [HS-20 ROM version is 1.06.02 or later] 1 ~ 180(min)	45
Check GC Ready	Set whether or not check the GC Ready.	On, Off	On
Extended GC Ready Check Limit	Set the extra time for GC Ready check when the check doesn't pass.	1 ~ 60(min)	10
Check Trap Cooling Ready	Set whether or not check the Trap Cooling Ready.	On, Off	On
Extended Trap Cooling Ready Check Limit	Set the extra time for Trap Cooling Ready check when the check doesn't pass.	1 ~ 60(min)	10
Analysis Mode	Set the HS-20 Analysis mode.	Constant, Progress, MHE	Constant
Progress Settings	Set the mode when [Analysis mode] is "progress"	Oven Temp., Equilib. Time	Oven Temp.
(Oven Temp.) Increment	Set the increment value when [Progress Settings] is "Oven Temp".	1 ~ 50(°C)	10
(Equilib. Time) Increment	Set the increment value when [Progress Settings] is "Equilib. Time".	0.1 ~ 60.0(min)	5.0
Needle Check	Set whether or not check the needle.	Yes, No	Yes
Action on Leak Check Error	Set the Action when leak Check is failed.	Stop, Continue, Skip	Continue
Allowable Number of Skip	Set the allowable number when [Action on Leak Check Error] is "Skip".	1 ~ 1000	100
Action with No vial on Tray	Set the Action when there's no vial on specified tray.	Stop, Skip	Skip
Use barcode	Set this on to use barcode reader.	On, Off	Off
Action on barcode reader error	Set the Action when there's an error of reading bar code.	Stop, Continue, Skip	Continue

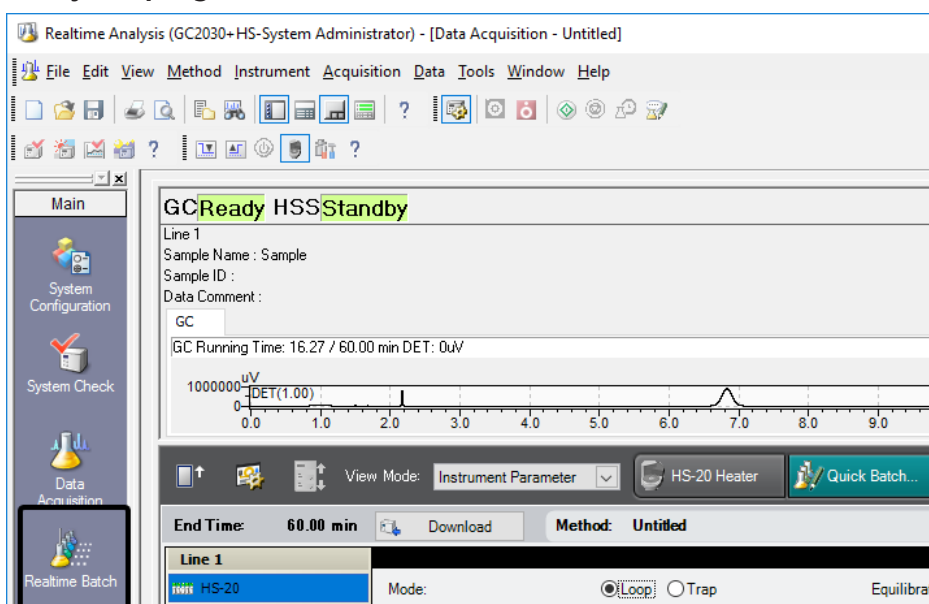
2.2 Batch Processing


In batch processing, the batch table in which injection conditions and analysis conditions for each sample are registered can be prepared.

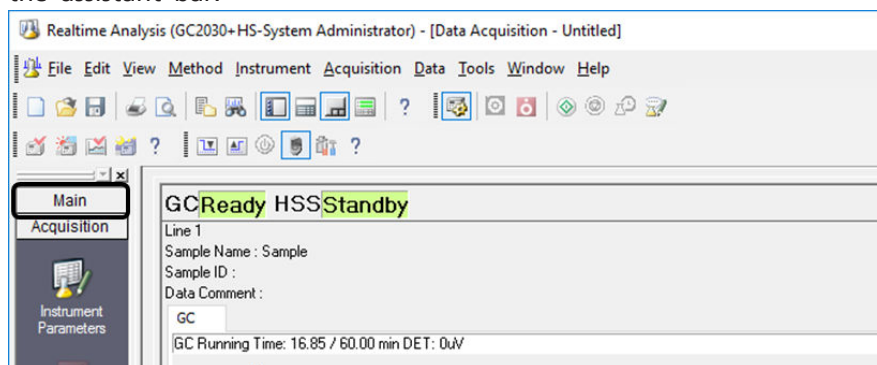
2.2.1 Preparing the batch table

1

Click the  (Realtime Batch) icon on the [Main] assistant bar in the [Realtime Analysis] program.

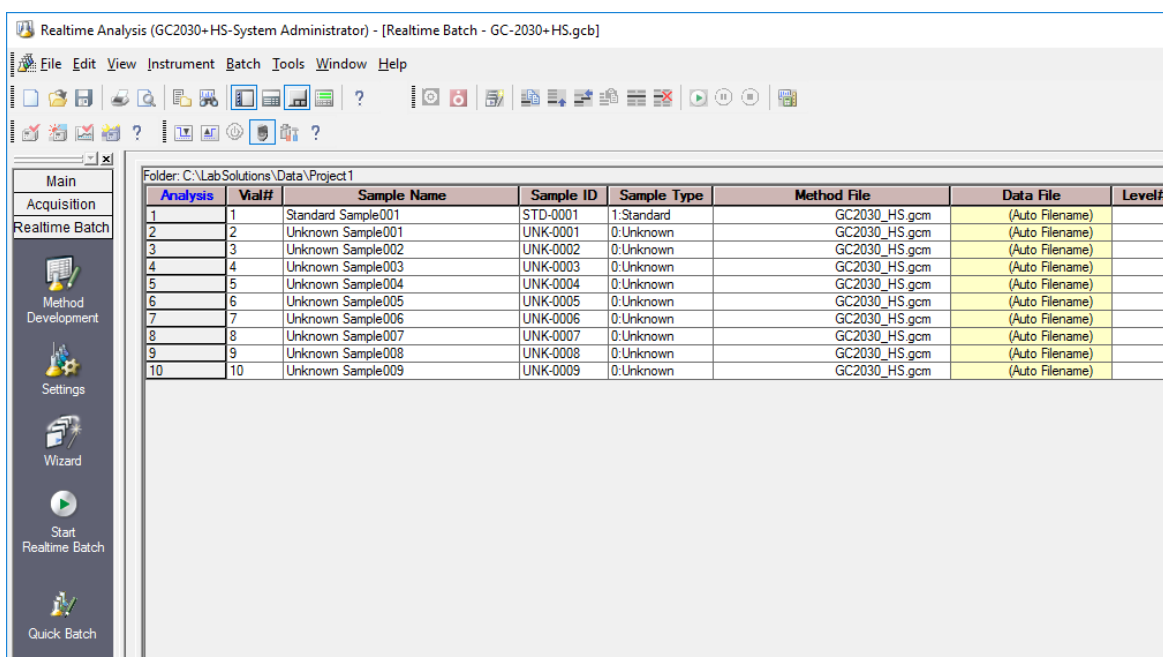


NOTE If the  (Realtime Batch) icon is not displayed, click on the title of the assistant bar.



2

Edit a batch table by referring to "4. Realtime Batch" in the Operators Guide.



You can create a batch table with simple operations by using the wizard.

With the MHE mode

Prepare the table for the number of samples X MHE times.

Example) 9 lines are prepared in the case of 3 samples X MHE 3 times.

Analysis	Vial#	Sample Name	Sample ID	Sample Type	Method File	Data File	Level#	Report Output	Report Format	Data Comment
1	1	Standard Sample001	STD-0001	1:Standard	GC2030_HS.gcm	(Auto Filename)	1	<input type="checkbox"/>	\DEFAULT.lsr	
2	1	Unknown Sample001	UNK-0001	0:Unknown	GC2030_HS.gcm	(Auto Filename)	0	<input checked="" type="checkbox"/>	Default.lsr	
3	1	Unknown Sample002	UNK-0002	0:Unknown	GC2030_HS.gcm	(Auto Filename)	0	<input checked="" type="checkbox"/>	Default.lsr	
4	2	Unknown Sample003	UNK-0003	0:Unknown	GC2030_HS.gcm	(Auto Filename)	0	<input checked="" type="checkbox"/>	Default.lsr	
5	2	Unknown Sample004	UNK-0004	0:Unknown	GC2030_HS.gcm	(Auto Filename)	0	<input checked="" type="checkbox"/>	Default.lsr	
6	2	Unknown Sample005	UNK-0005	0:Unknown	GC2030_HS.gcm	(Auto Filename)	0	<input checked="" type="checkbox"/>	Default.lsr	
7	3	Unknown Sample006	UNK-0006	0:Unknown	GC2030_HS.gcm	(Auto Filename)	0	<input checked="" type="checkbox"/>	Default.lsr	
8	3	Unknown Sample007	UNK-0007	0:Unknown	GC2030_HS.gcm	(Auto Filename)	0	<input checked="" type="checkbox"/>	Default.lsr	
9	3	Unknown Sample008	UNK-0008	0:Unknown	GC2030_HS.gcm	(Auto Filename)	0	<input checked="" type="checkbox"/>	Default.lsr	

2.2.2 Parameters (for HS only)

Parameter	Setting Range	Remarks
Vial number	1 ~ 90	When the headspace mode is MHE, the same vial number be set up to 9 times.

NOTE Be sure that the vial number settings in the batch table match the vial numbers of the HS main unit.

2.2.3 Precautions on batch table preparation

Since up to 9 repeat elutions may be conducted, set the same vial number to the number of times equivalent to the number of repetitions.


Examples)

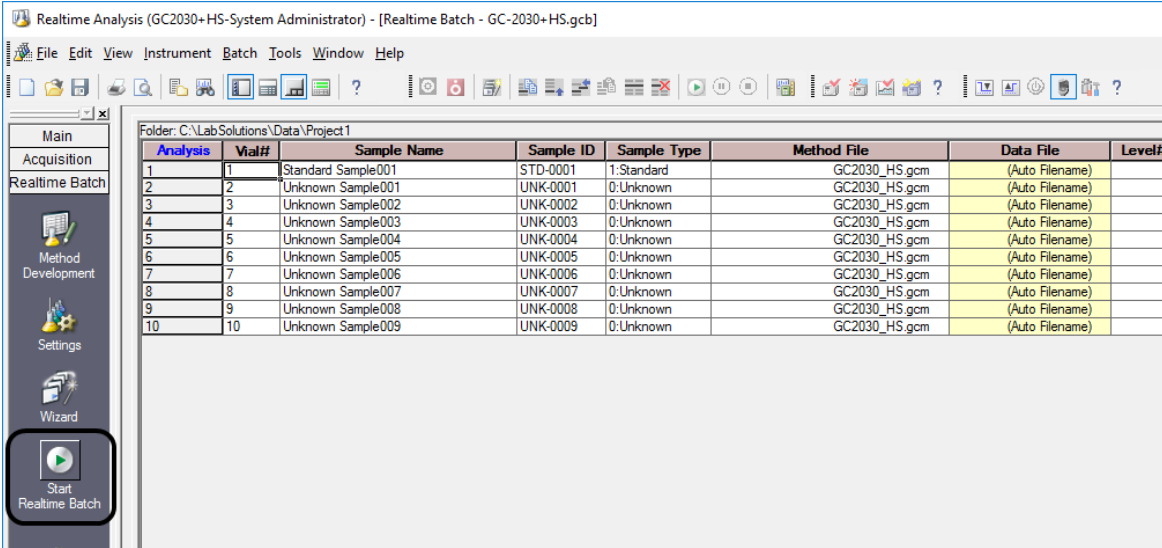
Line Number	Vial #
1	1
2	1
3	1
4	2
5	2
6	2
.	.
.	.

3 repeat elutions

NOTE When different HS parameters are set, an error is generated at the time of batch processing.

2.2.4 Starting the batch table

Click the  (Start Realtime Batch) icon on the [Realtime Batch] assistant bar.



The screenshot shows the Realtime Analysis software interface. The main window displays a table with the following columns: Analysis, Vial#, Sample Name, Sample ID, Sample Type, Method File, Data File, and Level#. The table contains 10 rows of data, with the first row being a standard sample and the remaining 9 rows being unknown samples. The 'Start Realtime Batch' icon is highlighted in the Realtime Batch assistant bar on the left.

Analysis	Vial#	Sample Name	Sample ID	Sample Type	Method File	Data File	Level#
1	1	Standard Sample001	STD-0001	1:Standard	GC2030_HS.gcm	(Auto Filename)	
2	2	Unknown Sample001	UNK-0001	0:Unknown	GC2030_HS.gcm	(Auto Filename)	
3	3	Unknown Sample002	UNK-0002	0:Unknown	GC2030_HS.gcm	(Auto Filename)	
4	4	Unknown Sample003	UNK-0003	0:Unknown	GC2030_HS.gcm	(Auto Filename)	
5	5	Unknown Sample004	UNK-0004	0:Unknown	GC2030_HS.gcm	(Auto Filename)	
6	6	Unknown Sample005	UNK-0005	0:Unknown	GC2030_HS.gcm	(Auto Filename)	
7	7	Unknown Sample006	UNK-0006	0:Unknown	GC2030_HS.gcm	(Auto Filename)	
8	8	Unknown Sample007	UNK-0007	0:Unknown	GC2030_HS.gcm	(Auto Filename)	
9	9	Unknown Sample008	UNK-0008	0:Unknown	GC2030_HS.gcm	(Auto Filename)	
10	10	Unknown Sample009	UNK-0009	0:Unknown	GC2030_HS.gcm	(Auto Filename)	

Continuous data acquisition is performed based on the batch table settings.

NOTE

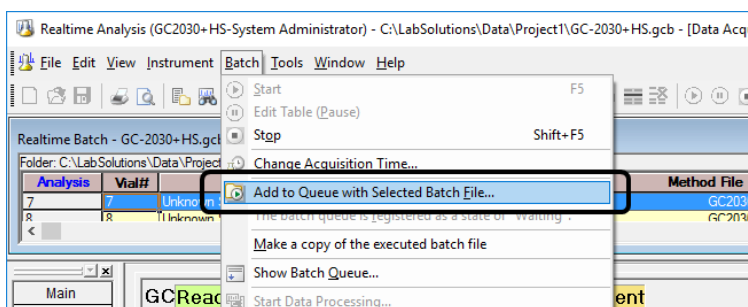
- While [Initializing] is displayed on [Instrument Status], please don't start analysis.
- When [Yes] is set for overlaps in the HS-20 System Configuration, the [Start/End Setting] and [Start Priority Batch] functions are not available. Note also that after batch analysis is stopped, it can restart only from the first row.

2.2.5 Running multiple batch files sequentially

In a batch table, you need to use the same HS parameters throughout all analyses. Therefore, when you wish to run multiple headspace analyses sequentially, you need to use the Batch Queue function.

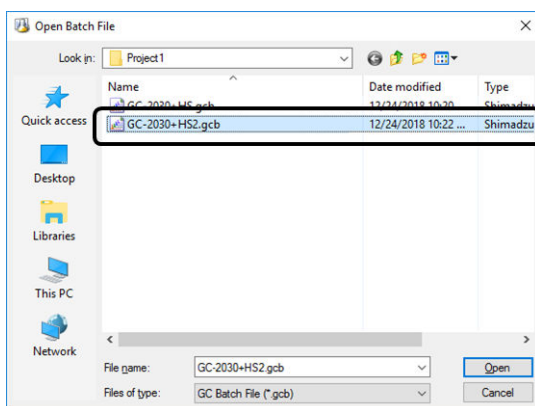
1

Select [Add to Queue with Selected Batch File] on the [Batch] menu during realtime batch.

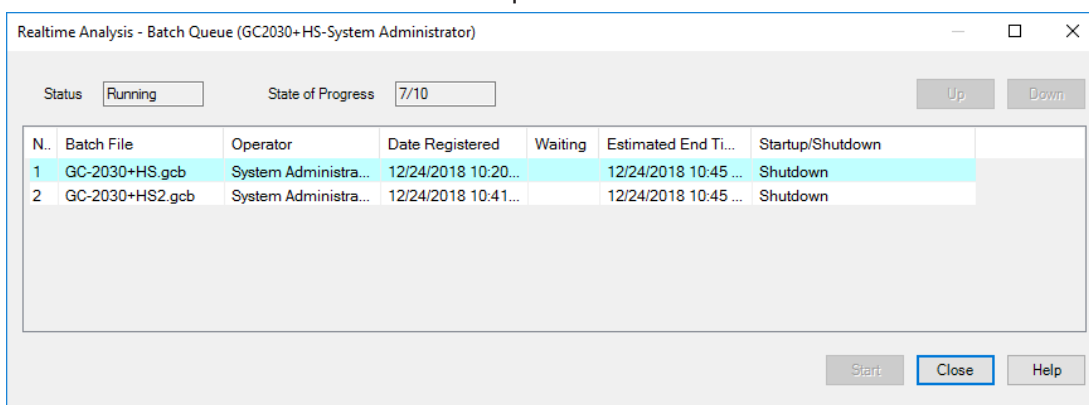


2

Select the batch file to continuously perform realtime batch on in the [Open Batch File] sub-window, and click [Open].



The batch file is added to the batch queue.

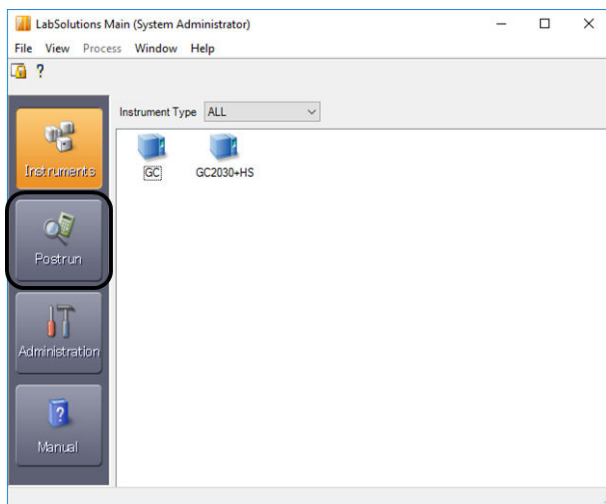


2.3 Display the Pre-treatment Result

You can check the HS-20 Pre-treatment result in the Data processing window.

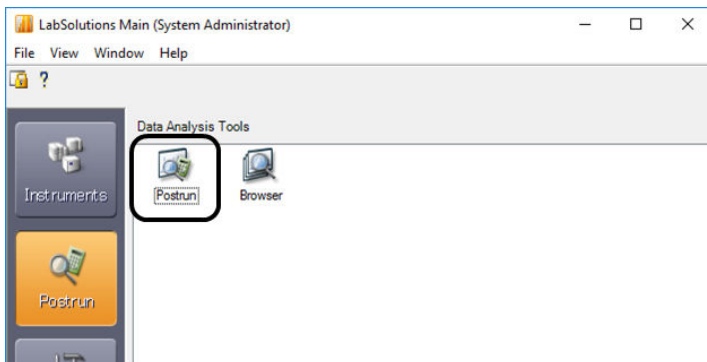
1


Click the  icon in the [LabSolutions Main] window.



2

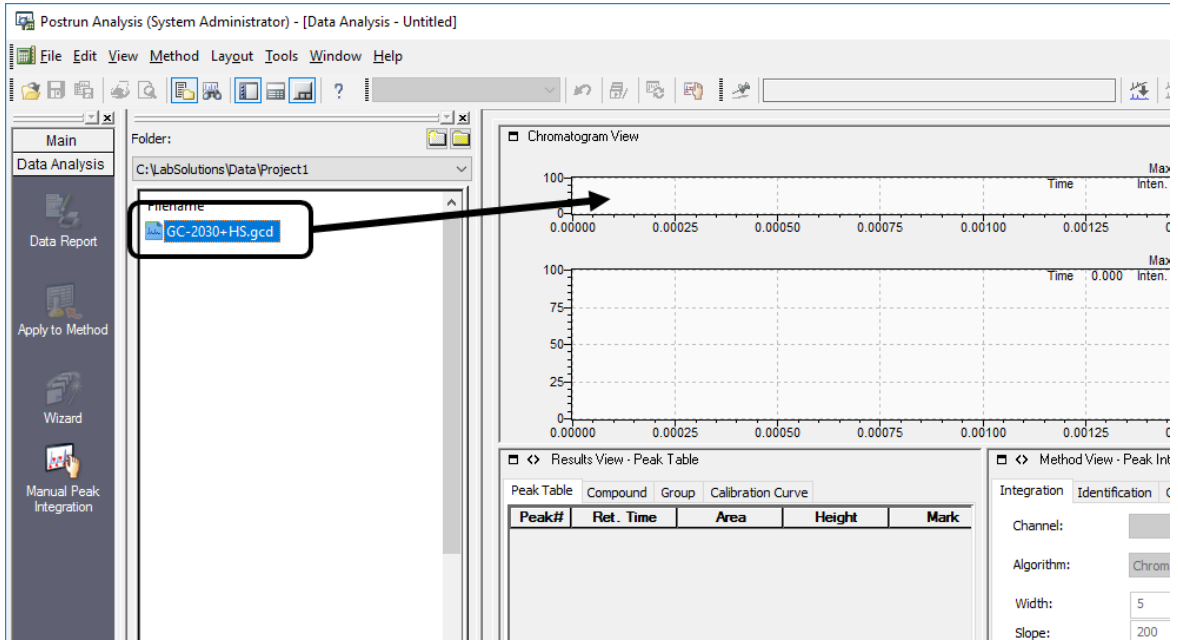
Double-click [Postrun].



NOTE The [Data Analysis] window can also be opened by clicking  (Data Analysis) icon on the [Acquisition] assistant bar.

3

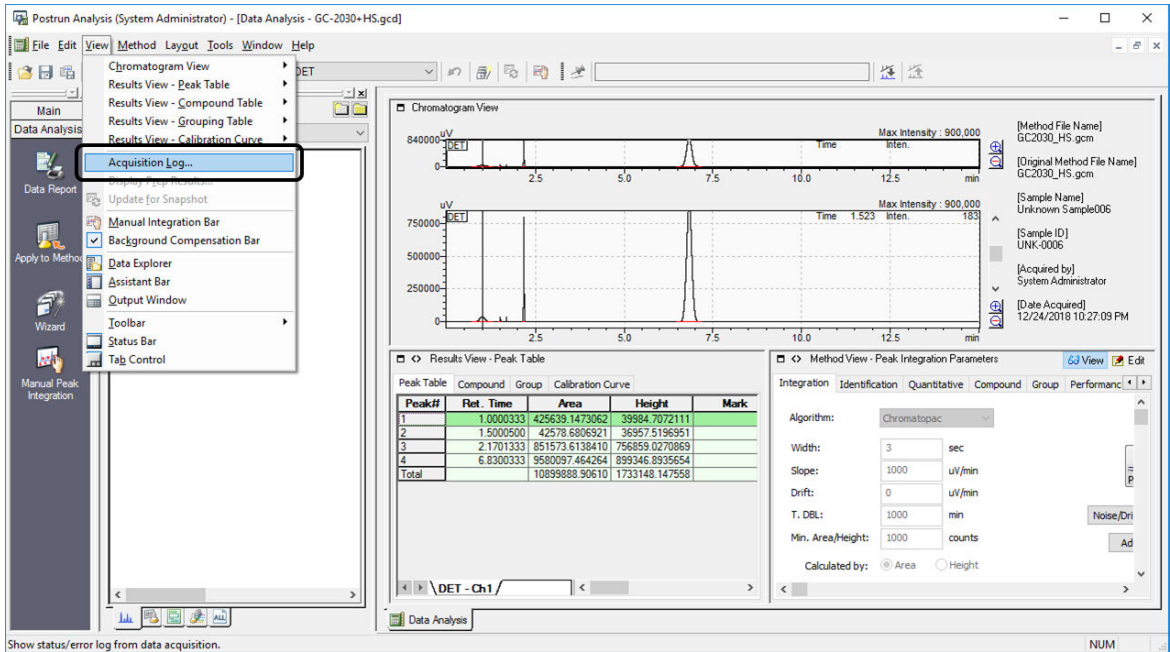
Drag-and-drop a data file onto the [Data Analysis] window from the [Data Explorer] subwindow.



2

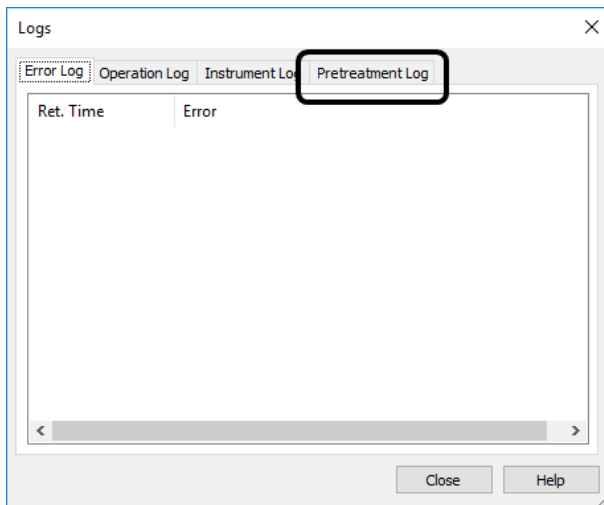
4

Click menu [View] - [Acquisition Log].



5

Click the [Pretreatment Log] tab.



NOTE [Pretreatment Log] tab is not displayed if the data file doesn't have HS-20 pretreatment result.

6

Check the HS-20 pretreatment log.

