

LabSolutions

HS-20 Control Software

Instruction Manual

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

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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 re-installation (after the product is moved).

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Notice

- Information in this manual is subject to change without notice and does not represent a commitment on the part of the vendor.
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- Microsoft® Windows 7® Operating System is referred to as “Windows 7”.
Microsoft® Windows Vista® Operating System is referred to as “Windows Vista”.
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- 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.

Instruction Manuals

■ 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.

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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 and CD-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 provided with the product.**



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1

Installation

1.1 Confirmation of parts

1

Please confirm that the following parts are contained:

- LabSolutions HS-20 Software
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

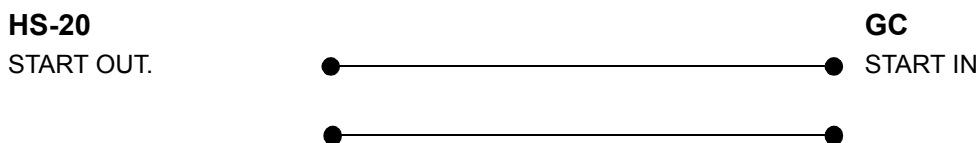
Reference

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

1

Connect the start signal cable.

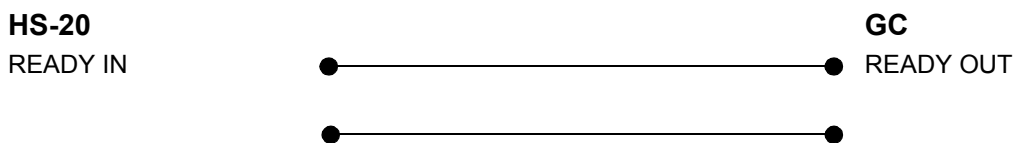
Before connecting this cable, power switch to both the HS main unit and the GC must be turned off.



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.

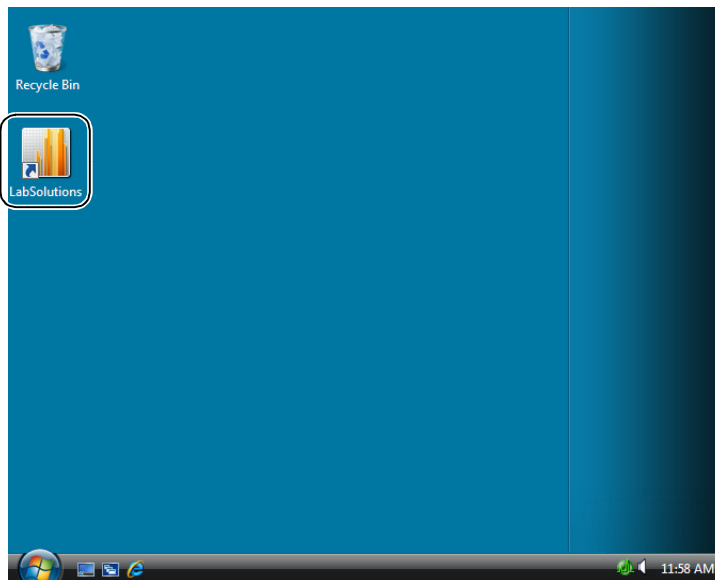


- 3 Connect the USB cable between HS-20 and PC.
- 4 Turn ON the power and confirm that it starts correctly.

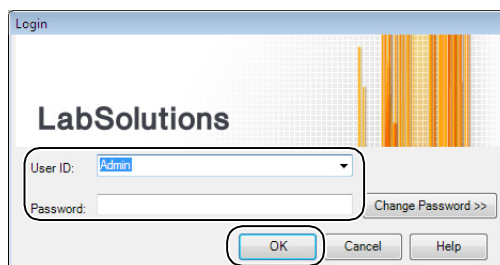
1.4 Software System Configuration

Registering the HS-20 enables analysis using the unit.

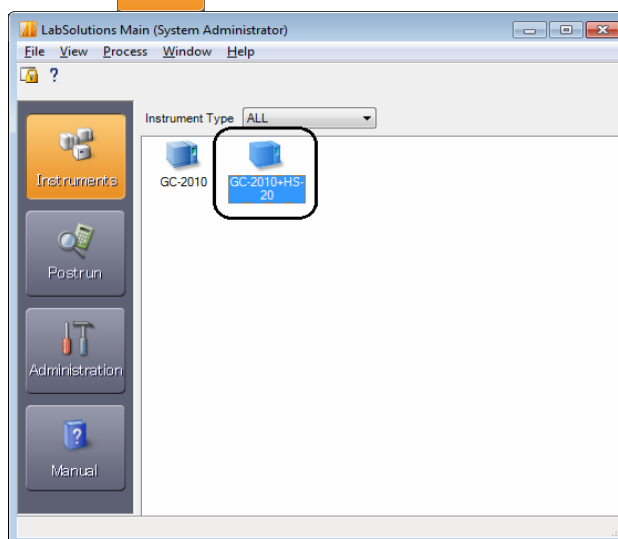
- 1 Turn each instrument on.
- 2 Turn the PC on, and start Windows.
- 3 Double-click the  (LabSolutions) icon displayed on the Windows Desktop.



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

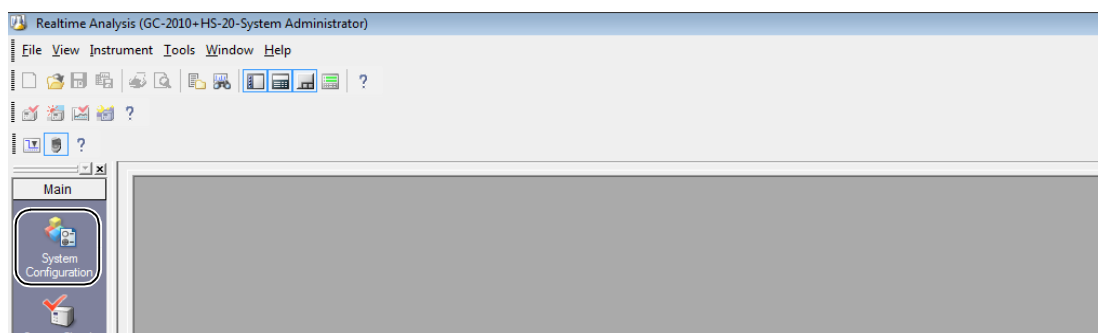


- 5** Click the  (Instruments) icon, and double-click the icon of the instrument to use.




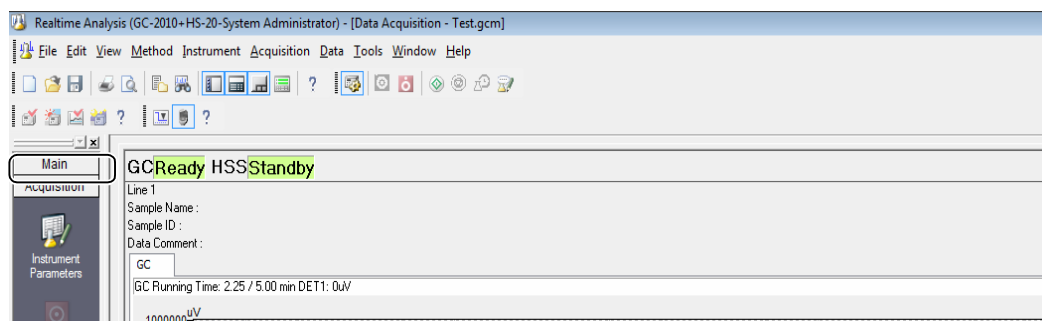
1

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

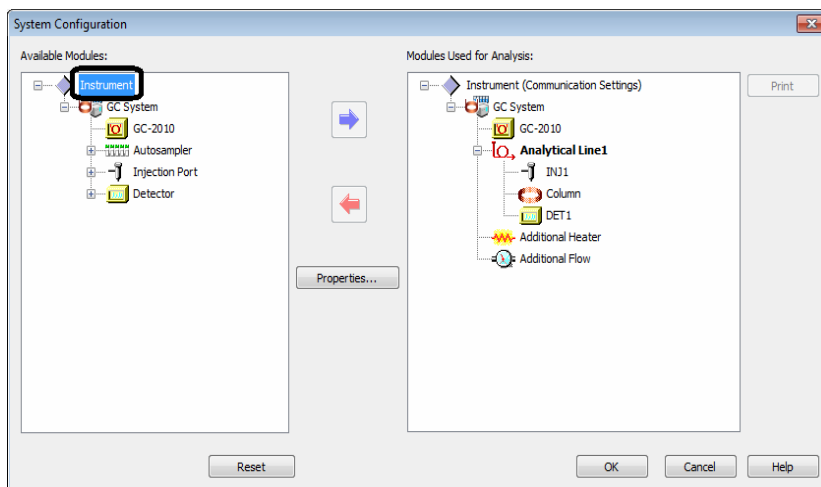


 **NOTE**

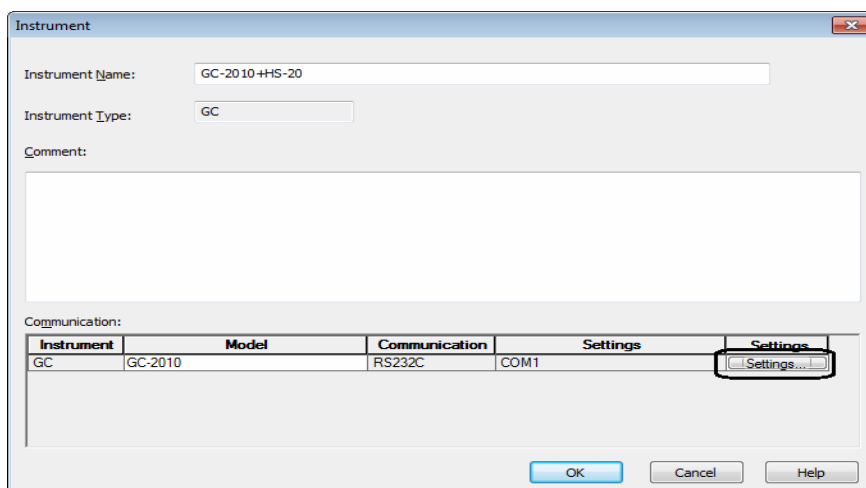
If the  (System Configuration) icon is not displayed, click on the title of the assistant bar.



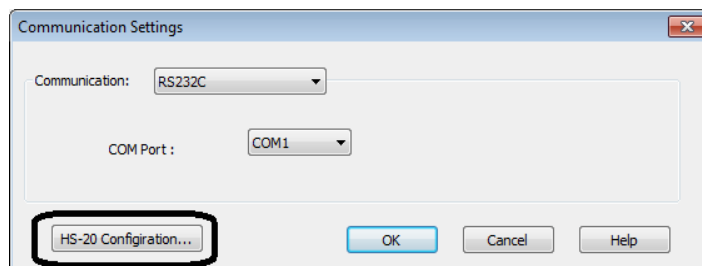
7 Double-click the [Instrument] icon at [Available Modules].



8 Click the [Settings] on [Communication].



9 Click the [HS-20 Configuration].

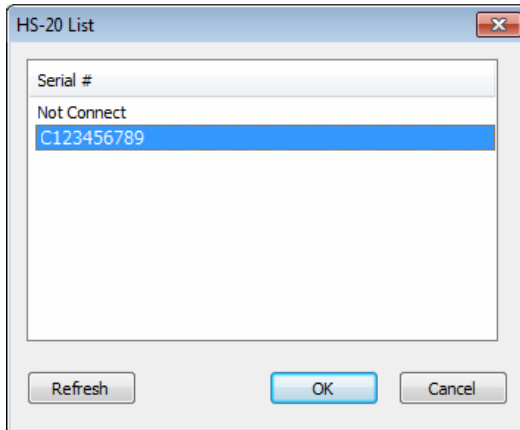


NOTE

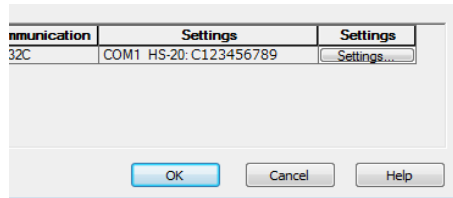
[HS-20 Configuration] is available, if the License for HS-20 is valid.

10

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

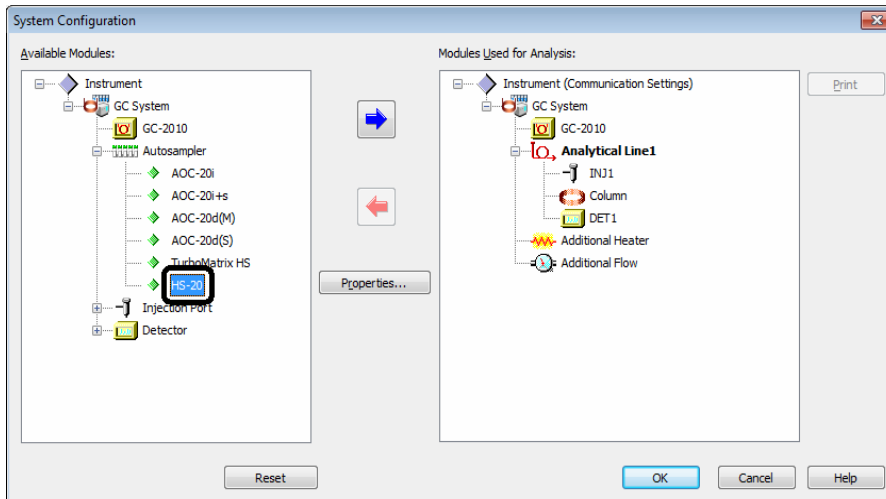


Serial number of HS-20 you select is appeared on [Settings] at [Communication], and [HS-20] icon is added to [Available Modules] at [System Configuration].



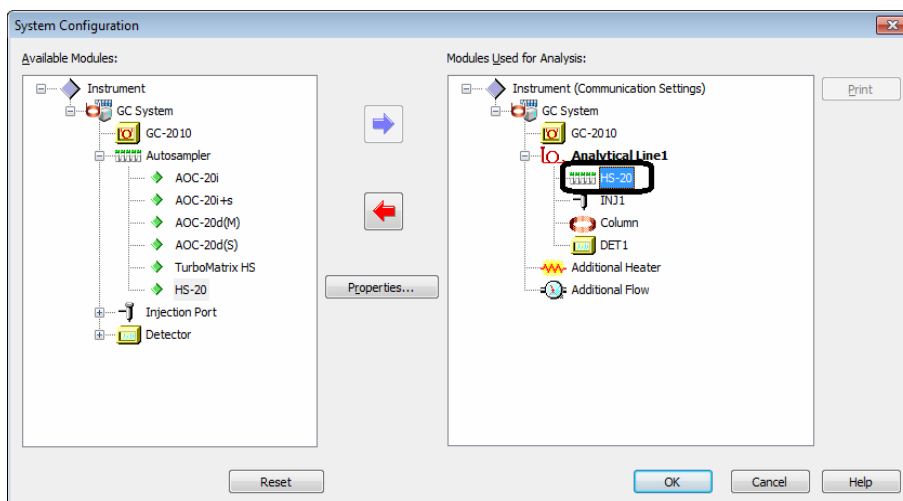
11

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

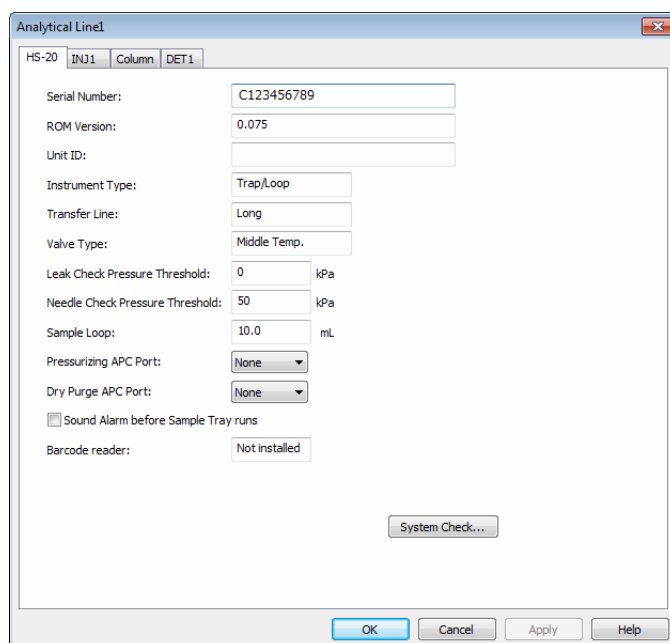


[HS-20] is added to [Modules Used for Analysis].

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 Barcode Reader are sent from HS-20 and displayed. And then, configure following parameters.

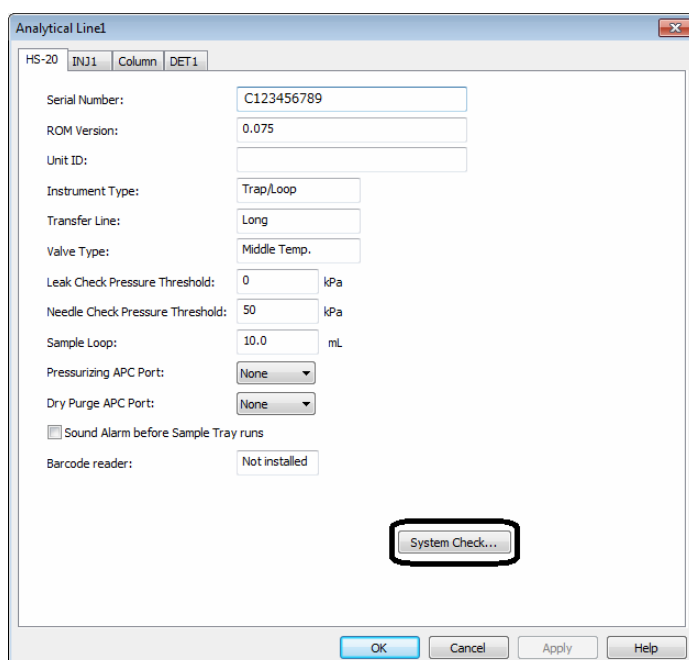
NOTE

There are items that cannot be displayed depending on options.

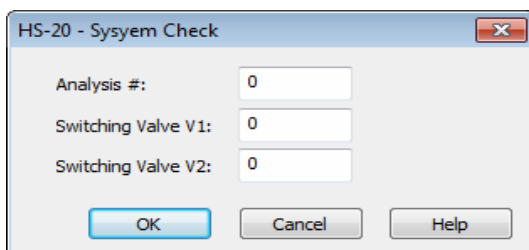
Parameters	Description	Setting Range (Unit)	Default
Unit ID	The instrument name or ID can be entered. The instrument name set here can be output to the system configuration report	Max. 15 characters	Blank
Leak Check Pressure Threshold	Set the threshold of leakage when pressurizing vials.	0 ~ 600(kPa)	0

Parameters	Description	Setting Range (Unit)	Default
Needle Check Pressure Threshold	Set the threshold of pressure when checking the needle clog.	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

14 Click [System Check].



15 Configure HS-20 [System Check] Parameters.



Parameters	Description	Setting Range (Unit)	Default
Analysis #	Set the threshold for alarm of HS-20 Analysis time.	0 ~ 999999	0

Parameters	Description	Setting Range (Unit)	Default
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

2

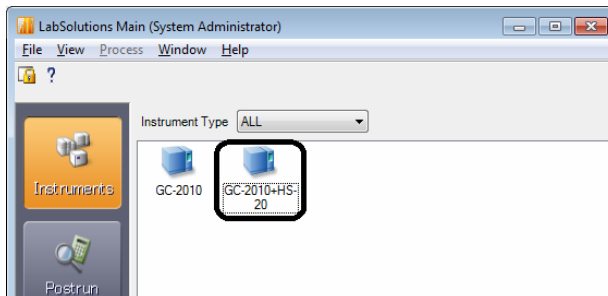
Operations

2.1 Method Development

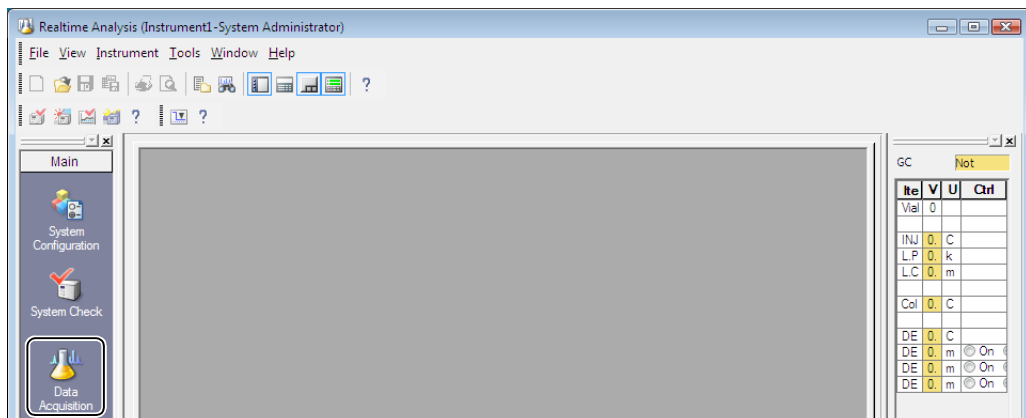
2.1.1 Edit Method File

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.

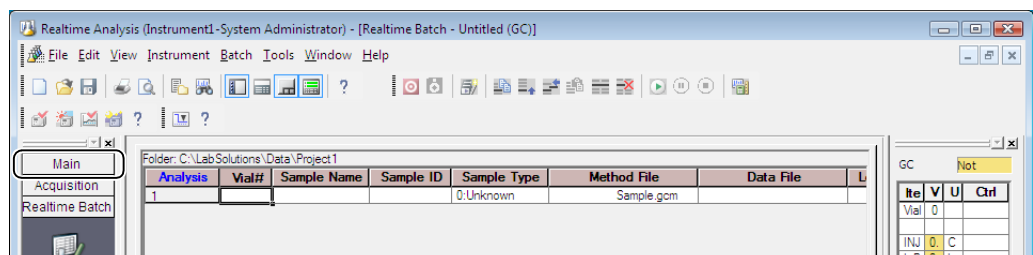


- 2 Click the  (Data Acquisition) icon on the [Main] assistant bar.



NOTE

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



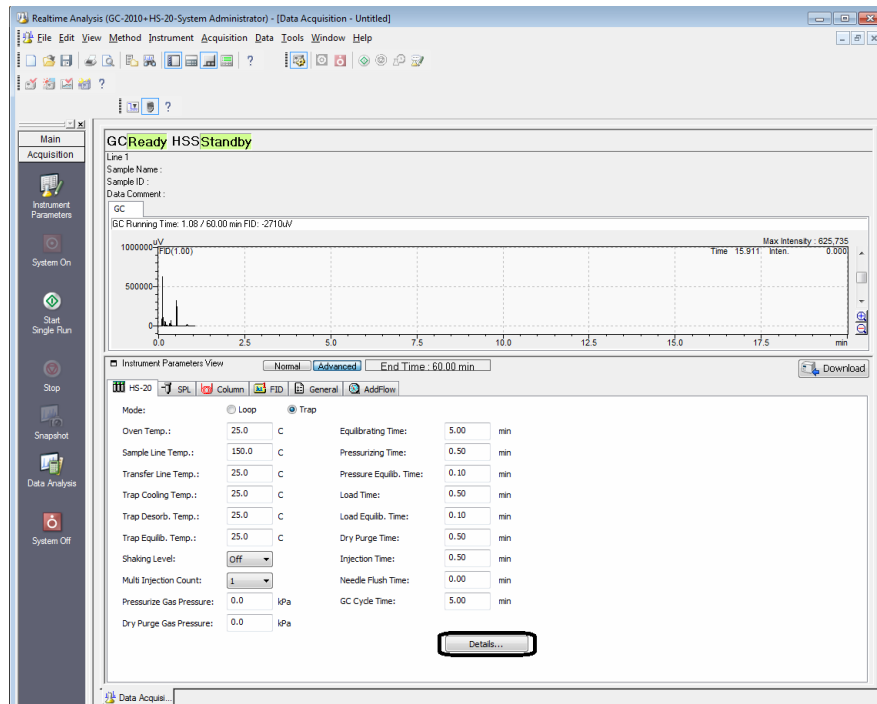
3 Set the analysis conditions for the HS-20 on the [HS-20] tab in [Instrument Parameter View], and then click [Details].

Reference

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

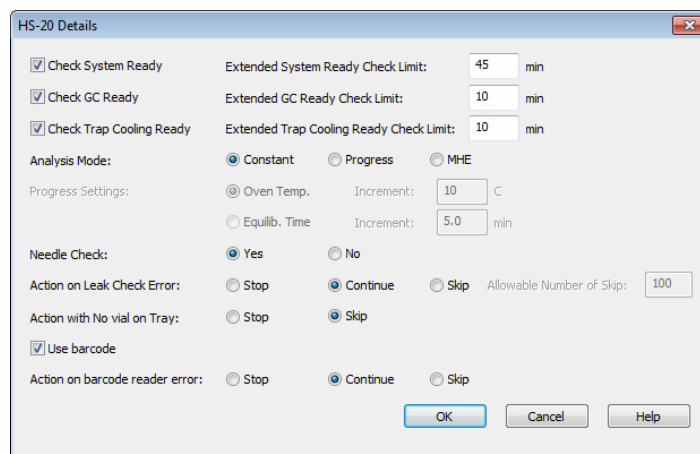
NOTE

There are items that cannot be displayed depending on options.



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

4 Set the HS-20 detail analysis conditions on the [HS-20 detail] and click [Ok].



2.1.2 Parameters

Parameters	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. : ~ 150 C] -30.0 ~ 80.0(C) [Sample Line-Temp. : 150 C ~ 250 C] -20.0 ~ 80.0(C) [Sample Line Temp. :250C~] -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)	25.0
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] 0.0 [bar] 0.00 [psi] 0.0
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] 0.0 [bar] 0.00 [psi] 0.0

Parameters	Description	Setting Range (Unit)	Default
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
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

Reference

- 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

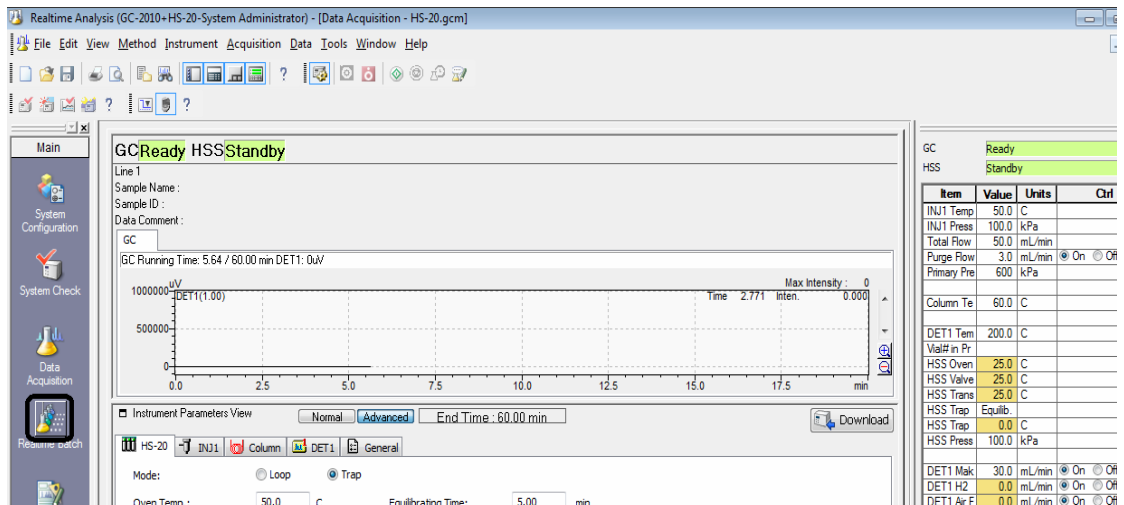
Parameters	Description	Setting Range (Unit)	Default
Check System Ready	Set whether or not check the HS-20 system Ready.	On, Off	On
Extended System Ready Check Limit	Set the extra time for System Ready check when the check doesn't pass.	1 ~ 60(min)	45
Check GC Ready	Set whether or not check the GC Ready.	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.

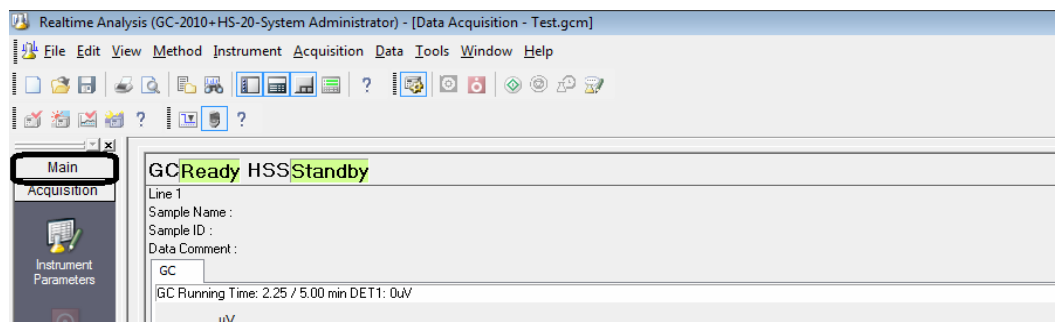


The screenshot shows the Realtime Analysis software interface. The title bar reads "Realtime Analysis (GC-2010+HS-20-System Administrator) - [Data Acquisition - HS-20.gcm]". The menu bar includes File, Edit, View, Method, Instrument, Acquisition, Data, Tools, Window, and Help. The Main assistant bar on the left contains icons for System Configuration, System Check, Data Acquisition, and Realtime Batch. The Realtime Batch icon is highlighted. The main window displays "GCReady HSSStandby" and a chromatogram plot. The plot shows a single peak at 2.771 minutes with an intensity of 0.000. The x-axis is labeled "Time" and ranges from 0.0 to 17.5 minutes. The y-axis is labeled "uV" and ranges from 0 to 1000000. The plot title is "GC Running Time: 5.64 / 60.00 min DET1: 0uV". Below the plot, the Instrument Parameters View shows "Normal" and "Advanced" tabs, with "End Time: 60.00 min" and a "Download" button. The Mode is set to "Trap". The right side of the interface shows a table of system parameters:

Item	Value	Units	Ctrl
GC	Ready		
HSS	Standby		
INJ1 Temp	50.0	C	
INJ1 Press	100.0	kPa	
Total Flow	50.0	mL/min	
Purge Flow	3.0	mL/min	On
Primary Pre	600	kPa	Off
Column Te	60.0	C	
DET1 Tem	200.0	C	
Val# in Pr			
HSS Oven	25.0	C	
HSS Valve	25.0	C	
HSS Trans	25.0	C	
HSS Trap	Equib.		
HSS Trap	0.0	C	
HSS Press	100.0	kPa	
DET1 Mak	30.0	mL/min	On
DET1 H2	0.0	mL/min	On
DET1 Air F	0.0	mL/min	On

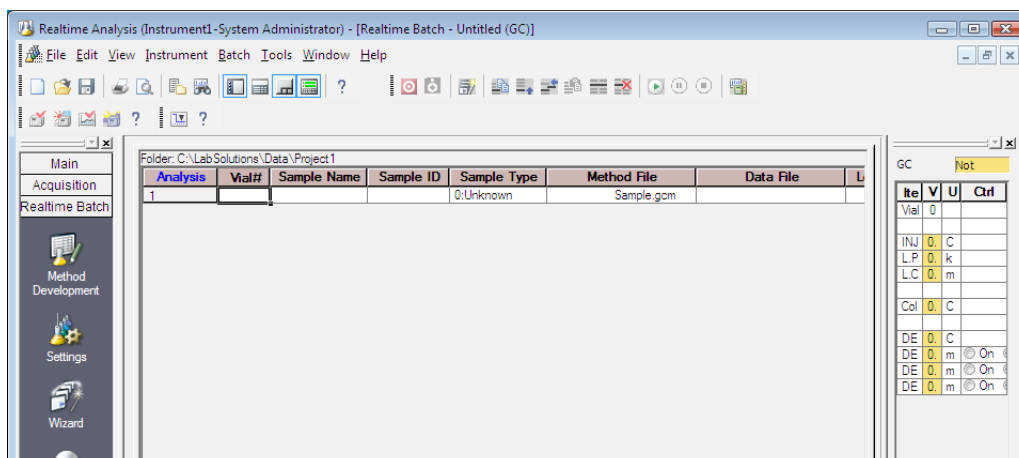
NOTE

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



The screenshot shows the Realtime Analysis software interface. The title bar reads "Realtime Analysis (GC-2010+HS-20-System Administrator) - [Data Acquisition - Test.gcm]". The menu bar includes File, Edit, View, Method, Instrument, Acquisition, Data, Tools, Window, and Help. The Main assistant bar on the left contains icons for Main, Acquisition, and Instrument Parameters. The Main icon is highlighted. The main window displays "GCReady HSSStandby" and a chromatogram plot. The plot shows a single peak at 2.25 minutes with an intensity of 0.000. The x-axis is labeled "Time" and ranges from 0.0 to 17.5 minutes. The y-axis is labeled "uV" and ranges from 0 to 1000000. The plot title is "GC Running Time: 2.25 / 5.00 min DET1: 0uV".

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

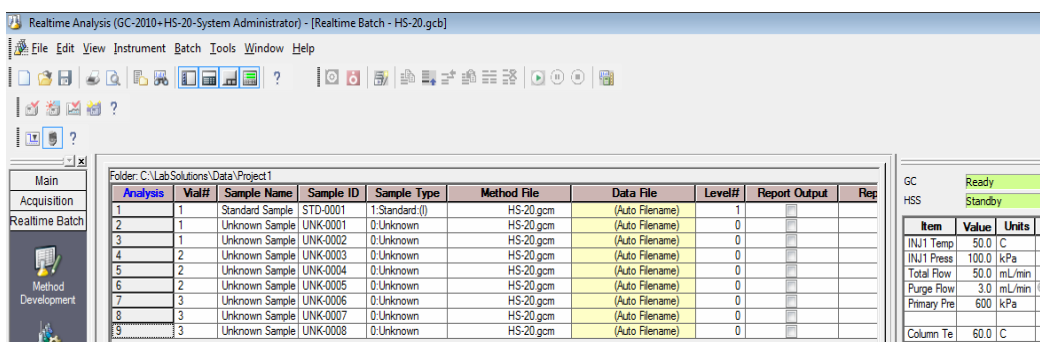


You can create a batch table with simple operations by using the wizard.

■ 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.



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.

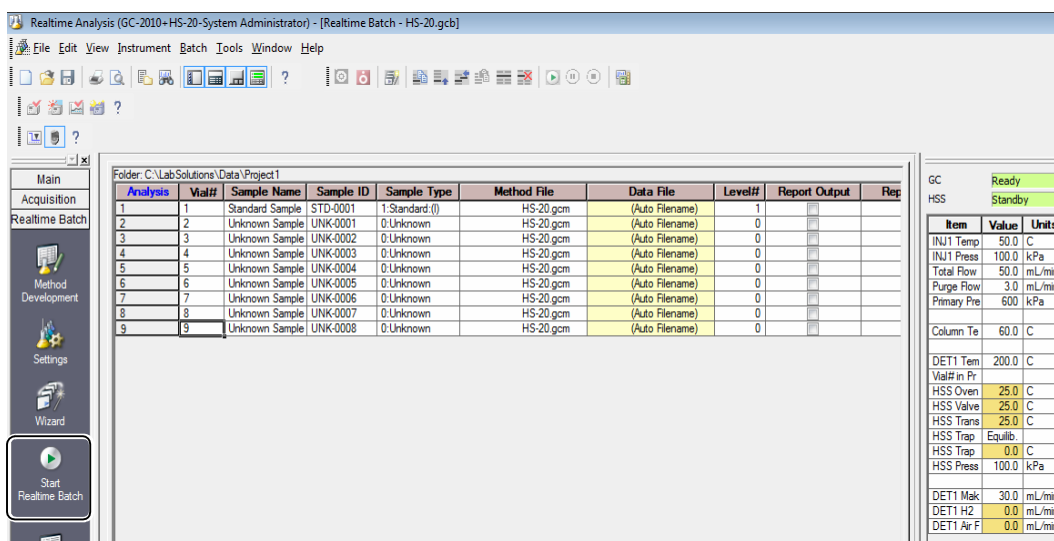
Examples)	Line Number	Vial #
	1	1
	2	1
	3	1
	4	2
	5	2
	6	2
	.	.
	.	.
		3 repeat elutions

NOTE

- When different HS parameters are set, an error is generated at the time of batch processing.
- Be sure to set a vial to the position in the HS main unit corresponding to the vial number specified in the batch table. If no vial is present at the position, batch processing must be stopped.

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 (GC-2010+HS-20-System Administrator) - [Realtime Batch - HS-20.gcb]' window. The main area displays a table with columns: Analysis, Vial#, Sample Name, Sample ID, Sample Type, Method File, Data File, Level#, Report Output, and Rep. The table contains 9 rows of data for unknown samples. On the right side, there is a 'GC' status panel showing 'Ready' and 'Standby' indicators, and a 'HSS' status panel with various parameters like INJ1 Temp, INJ1 Press, Total Flow, Purge Flow, Primary Pre, Column Te, DET1 Tem, Val# in Pr, HSS Oven, HSS Valve, HSS Trans, HSS Trap Equilib, HSS Trap, HSS Press, DET1 Mak, DET1 H2, and DET1 Air F.

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

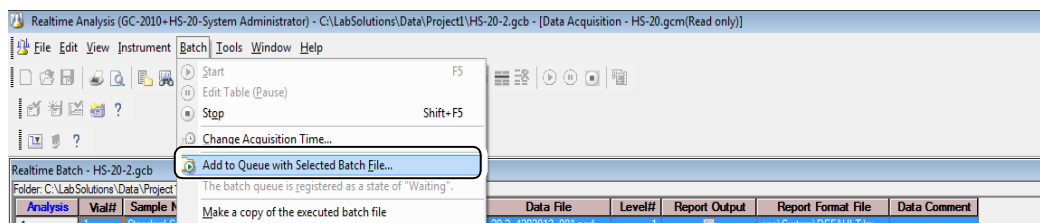
NOTE

- While [Initializing] is displayed on [Instrument Status], please don't start analysis.
- For HS-20 analysis, [Start/End Setting] and [Start Priority Batch] function are not available. Note that after batch analysis is stopped, it can restart only from the first row.

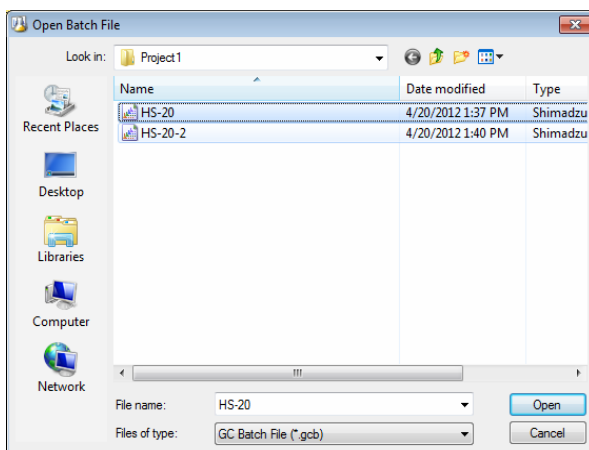
2.2.5 Running multiple batch files sequentially

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.

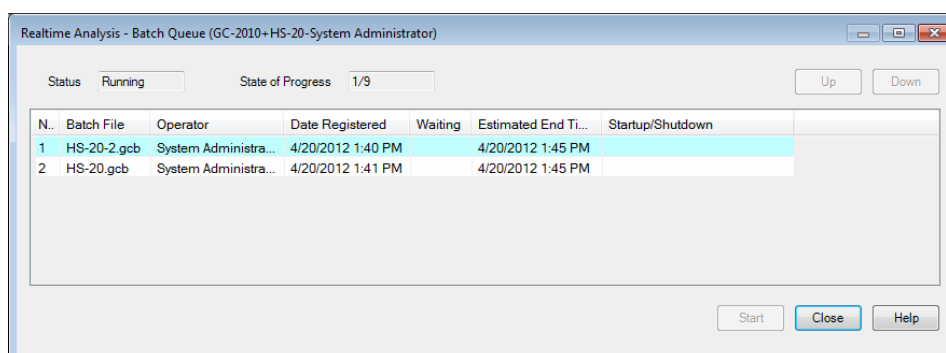
- 1 Select **[Add to Queue with Selected Batch File]** on the **[Batch]** menu during realtime batch.



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



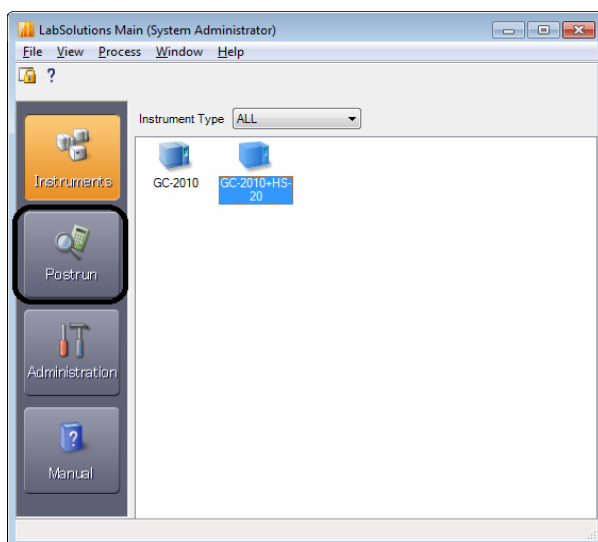
The batch file is added to the batch queue.



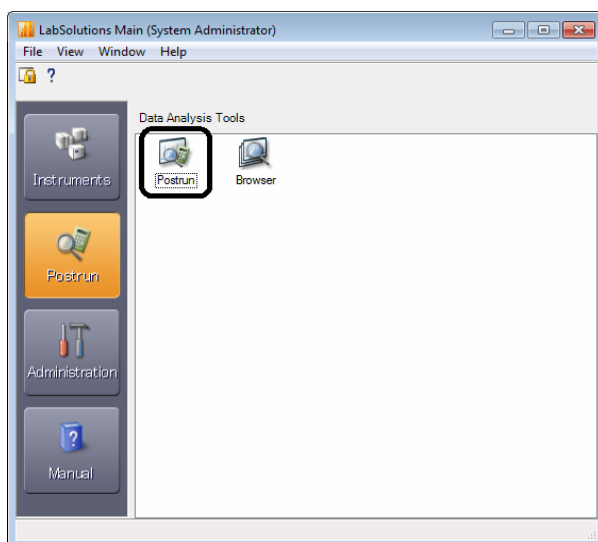
2.3 Display the Pre-treatment Result

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


- 1 Click the  icon in the [LabSolutions Main] window.



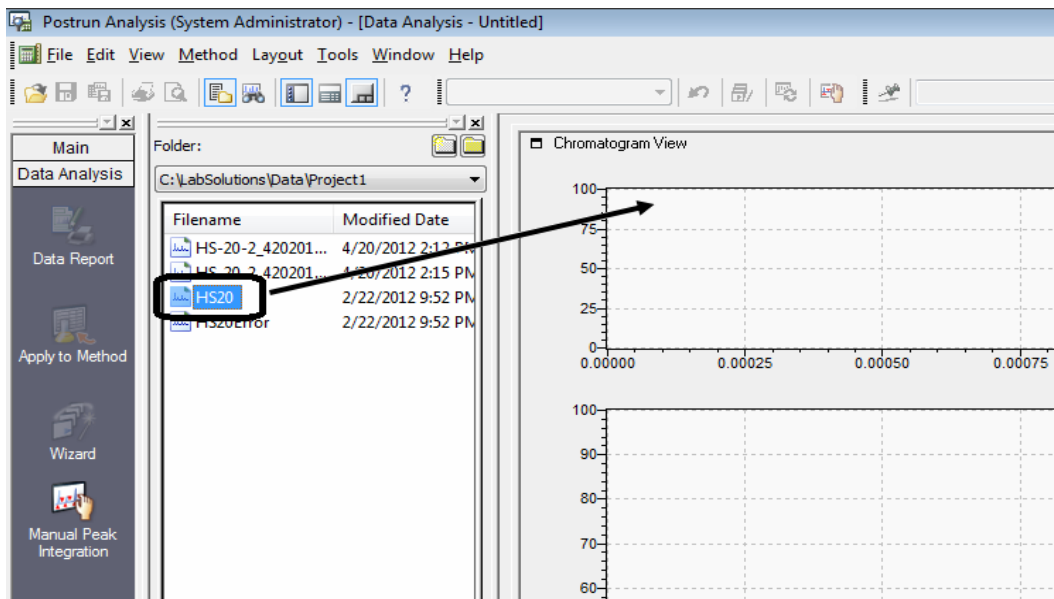
- 2 Double-click [Postrun].



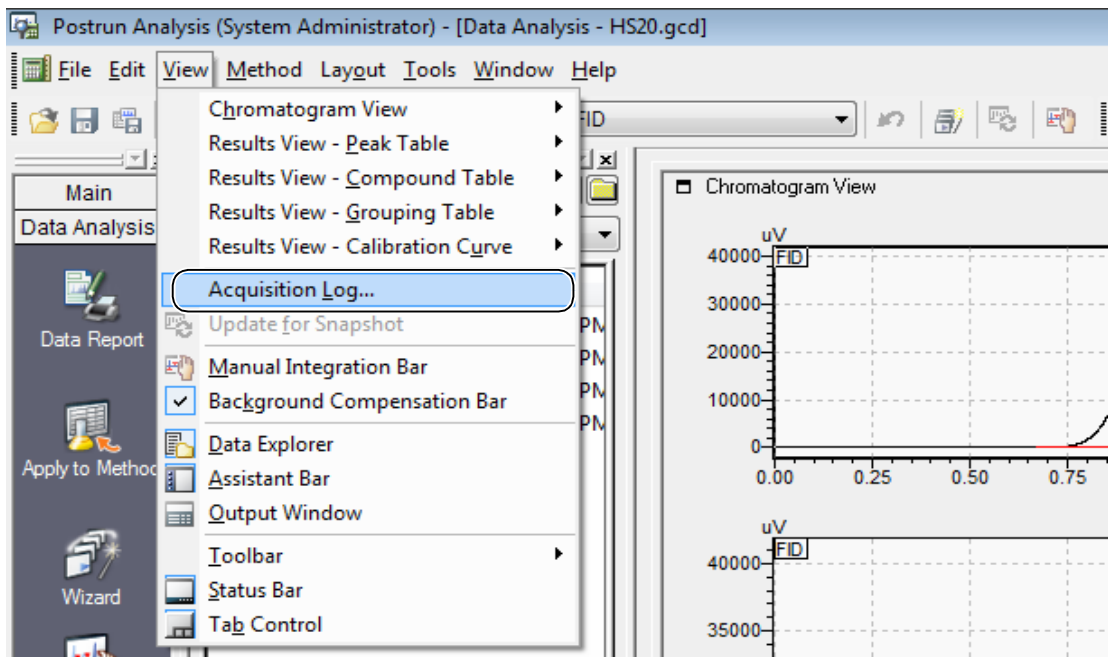
NOTE

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

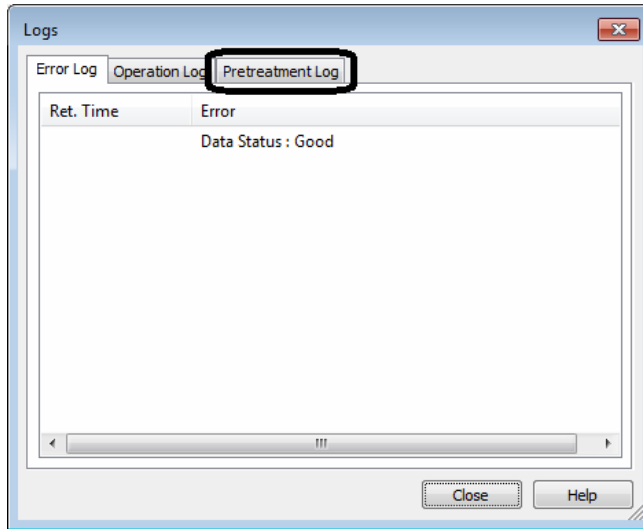
- 3** Drag-and-drop a data file onto the [Data Analysis] window from the [Data Explorer] sub-window.



- 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.

