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LabSolutions
TurboMatrixHS Control Software
Operation Guide

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

SHIMADZU CORPORATION
KYOTO JAPAN
ANALYTICAL & MEASURING INSTRUMENTS DIVISION

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Introduction

Read this Instruction Manual thoroughly before using the product.

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

This software is for controlling the TurboMatrixHS unit in the LabSolutions system.

Installing this software allows you to develop methods for controlling the TurboMatrixHS 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).

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.
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  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.
- Microsoft® Windows 7® Operating System is referred to as “Windows 7”.
  Microsoft® Windows Vista® Operating System is referred to as “Windows Vista”.
  Microsoft® Windows® XP Professional Edition is referred to as “Windows XP”.
- 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.

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 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.**

Contents

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1 Installation

1.1 Confirmation of parts

Please confirm that the following parts are contained:

- LabSolutions HS Software
  USB 1
  LabSolutions TurboMatrixHS control software instruction manual
- Start signal cable and READY signal cable (attached to TurboMatrixHS)
- RS-232C cable(needs to be separately purchased)

1.2 Notes of Installing

For installing the TurboMatrixHS main unit, refer to the instruction manual for the main unit.

Be sure to use the TurboMatrixHS main unit firmware of version 2.14.83 or later.

The communications between the PC and TurboMatrixHS are carried out via RS-232C cable. Use can use any COM port for communications; however, you are required to specify the COM port in the HS Communication Settings dialog box under the TurboMatrixHS system configuration after installing the Software.

1.3 Connection

☞ Reference

Refer to the instruction manual of the HS 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.

TurboMatrixHS		GC
Start N.O.	#5	START IN
	#6	

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.

TurboMatrixHS		GC
Ready In	#9	READY OUT
Ground	#12	

3 **Connect the RS-232C cable between TurboMatrixHS and PC.**

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

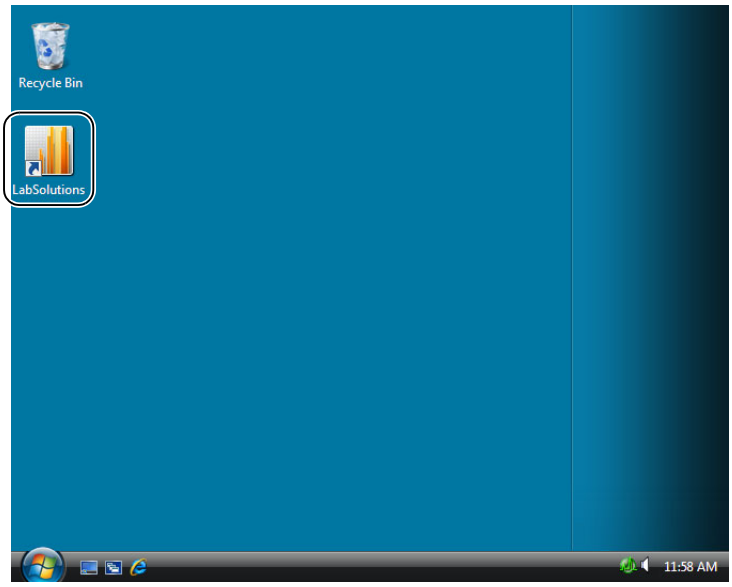
1.4 Sofeware System Configuration

Registering the TurboMatrixHS enables analysis using the unit.

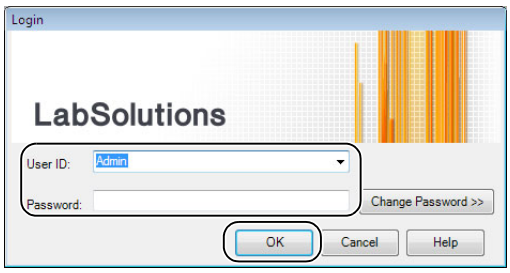
1 **Turn each instrument on.**

2 **Turn the PC on, and start Windows.**

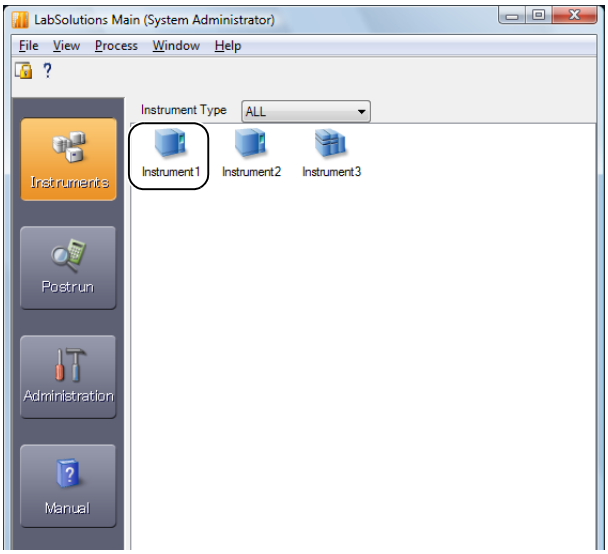
3 **Double-click the**  **(LabSolutions) icon displayed on the Windows Desktop.**



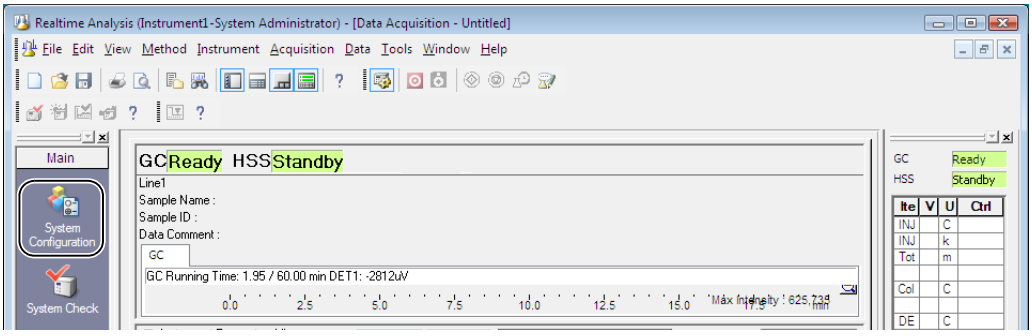
4 **Enter "Admin" at [User ID], and click [OK].**



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

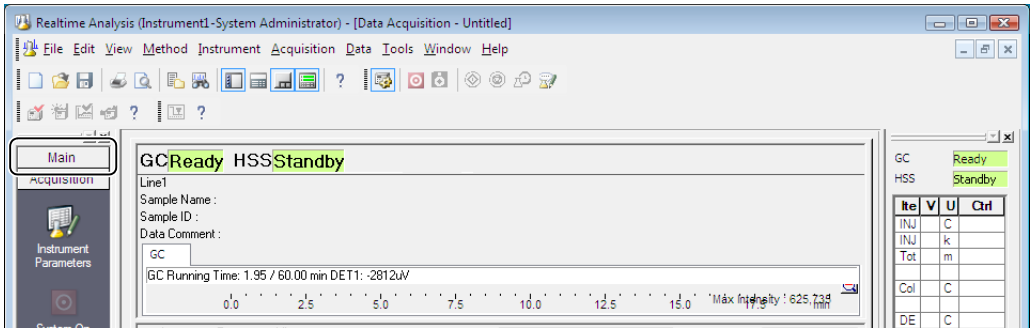


6 Click the (System Configuration) icon on the [Main] assistant bar.

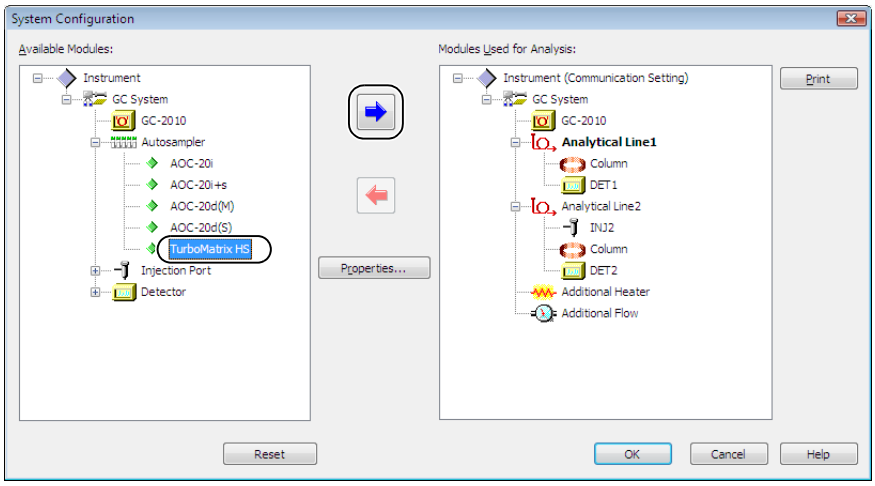


NOTE

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

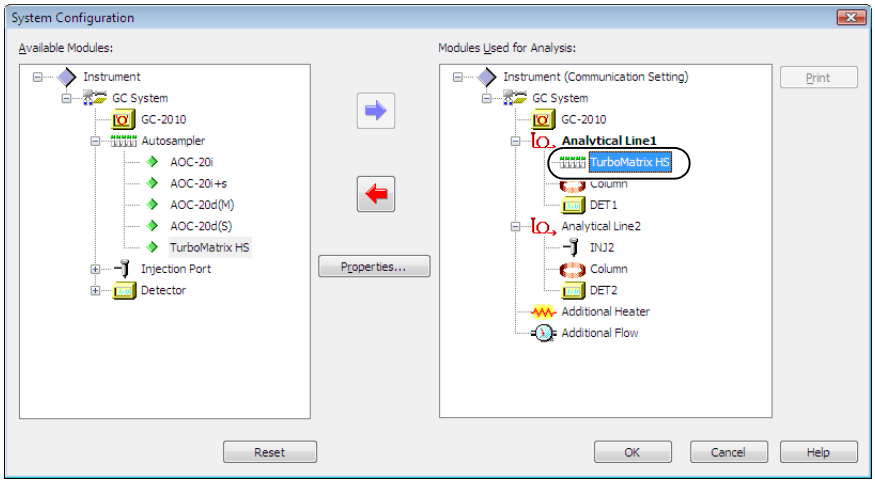


7 **Select [TurboMatrixHS] in the [Autosampler] list at [Available Modules], and click .**

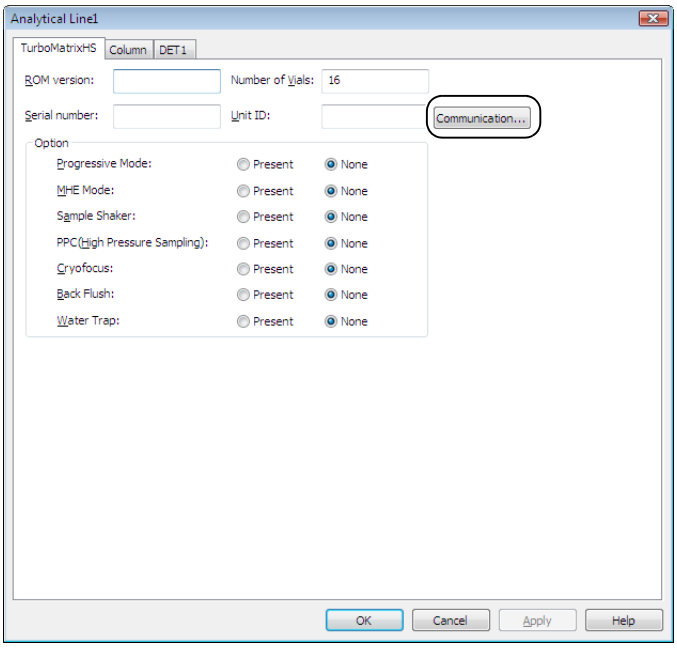


[TurboMatrixHS] is added to [Modules Used for Analysis].

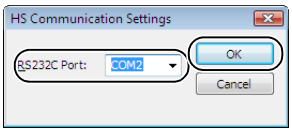
8 **Double-click the [TurboMatrixHS] icon at [Modules Used for Analysis].**



9 Click [Communication].



10 Select [RS232C Port], and click [OK].



Upon establishment of connection, the information on the ROM version, largest vial number, serial number, and presence/absence of optional units is sent to the PC and displayed.

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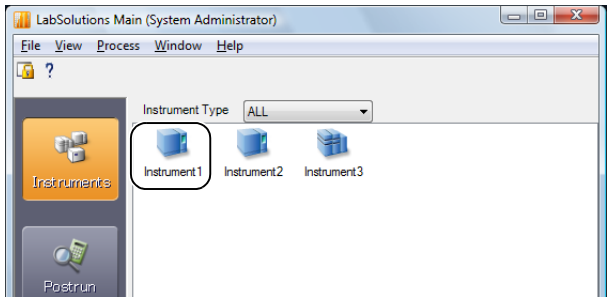
2 Operations

2.1 Method Development

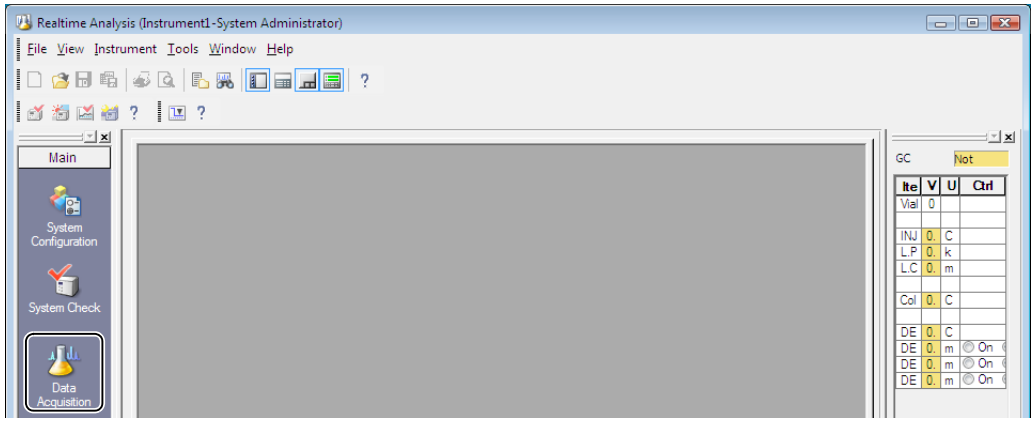
2.1.1 Edit Method File

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

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

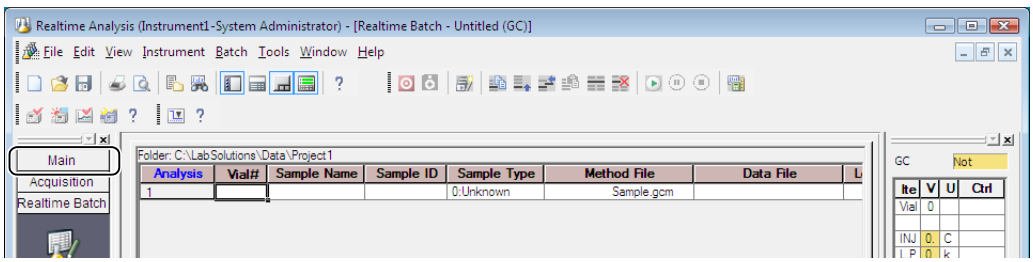


2 **Click the**  **(Data Acquisition) icon on the [Main] assistant bar.**



NOTE

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



NOTE

When software is launched, "---" is displayed on HSS parameters of [setting] column on [Instrument Monitor]. Please click [Download] Download or start analysis, and current [setting] value is displayed.

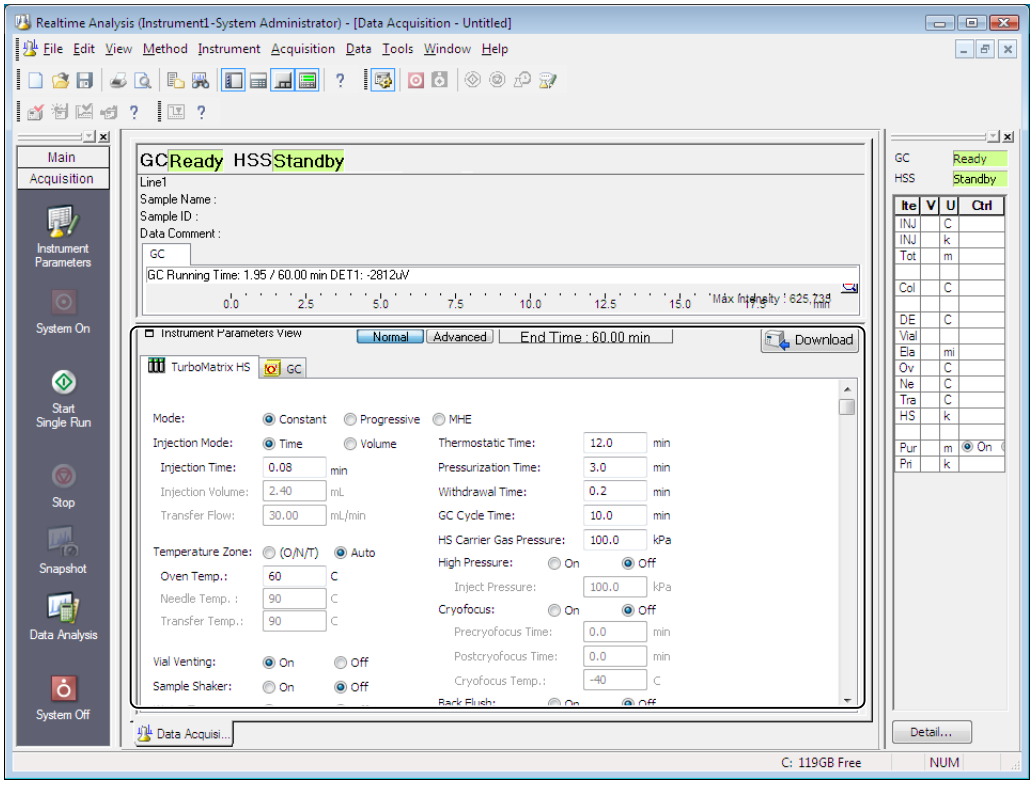
3 Set the analysis conditions for the HS on the [TurboMatrixHS] tab in [Instrument Parameter View].

Reference

If the [TurboMatrixHS] tab is not displayed in [Instrument Parameter View], refer to *"1.4 Sofeware System Configuration" P.2*.

NOTE

There are items that cannot be displayed depending on options. The following figure shows the state in which all the items are displayed for explanation. So, it is different from the actual screen.



2.1.2 Parameters

Parameters	Description	Setting Range (Unit)	Default
Mode	Select an operating mode here.	Constant Progressive MHE	Constant
Injection Mode	Select either of time or volume as a measure for determining injection amount. Time: set Injection Time. Volume: set Injection Volume and Transfer Flow. Injection time calculated using the formula below is set to the instrument. (Injection Time) = (Injection Volume) / (Transfer Flow)	Time Volume	Time
Injection Time	Specify the injection amount by time.	0.00 ~ 9.99 min	0.08
Injection Volume	Specify the injection amount by volume.	0.00 ~ 9.99 mL	2.40
Transfer Flow	Specify the transfer flow rate.	0.01 ~ 50.00 mL/min	30
Temperature Zone	Specify a method for setting the temperatures for heated zones. O/N/T: Allows you to specify each temperature independently from others. Auto: Only the oven temperature is specified. The temperatures for other units are automatically set to 5°C above the oven temperature.	O/N/T Auto	O/N/T
Oven Temp.	Specify the oven temperature.	35 ~ 210 °C	60
Needle Temp.	Specify the needle temperature.	35 ~ 210 °C	90
Transfer Temp.	Specify the transfer tube temperature.	35 ~ 210 °C	90
Thermostatting Time	Specify the heating time in the thermostat oven.	0.0 ~ 999.9 min	12
Pressurization Time	Specify the time to pressurize sample vials.	0.0 ~ 300.0 min	3
Withdrawal Time	Specify the time to withdraw sample vials.	0.0 ~ 99.9 min	0.2
GC Cycle Time	Specify the cycle time from sample injection to the state ready for analyzing next sample.	0.1 ~ 999.9 min	10
HS Carrier Gas Pressure	Specify carrier gas pressure.	0.0 ~ 400.0 kPa	100
		0.0 ~ 58.0 psi	14.5
High Pressure	Turns ON/OFF the high-pressure sampling function.	ON, OFF	OFF
Inject Pressure	Turns ON/OFF the cryofocus function.	0.0 ~ 414.0 kPa	100
		0.0 ~ 60.0 psi	14.5
Vial Venting	Specify the injection pressure for high-pressure sampling.	ON, OFF	ON
Sample Shaker	Turns ON/OFF the vial venting function.	ON, OFF	OFF
Water Trap	Turns ON/OFF the sample shaker function.	ON, OFF	OFF
Cryofocus	Turns ON/OFF the water trap function.	ON, OFF	OFF
Precryofocus Time	Specify the time for performing precryofocus.	0.0 ~ 300.0 min	0
Postcryofocus Time	Specify the time for performing postcryofocus.	0.0 ~ 300.0 min	0
Cryofocus Temp.	Specify the temperature for cryofocus.	-180 ~ -10 °C	-40
Back Flush	Turns ON/OFF the back flush function.	ON, OFF	OFF
Back Flush On Time	Specify the time to start back flushing.	0.0 ~ 300.0 min	0

Parameters		Description	Setting Range (Unit)	Default
	Back Flush Off Time	Specify the time to stop back flushing.	0.0 ~ 300.0 min	0
	Back Flush Pressure	Specify the pressure for back flushing.	0.0 ~ 2.6 kPa	0
			0.0 ~ 0.4 psi	0

Reference

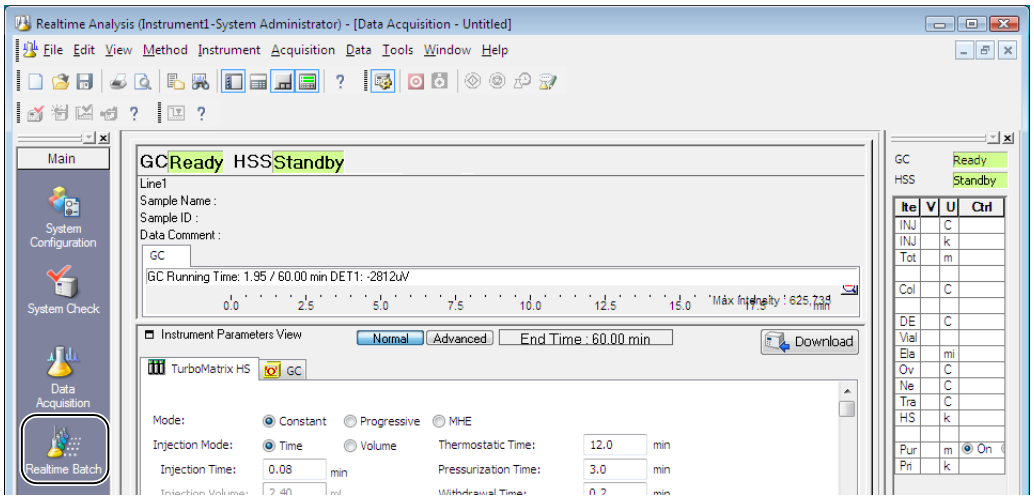
- The time event function cannot be set.
- For GC Cycle Time (Thermostatting Time when in the MHE mode), set a time longer than the total time of GC Analysis Time plus Cooling Time. Cooling time should be about 10 minutes when the initial temperature is 50°C or higher and about 15 minutes when less than 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.
- Usually, set Temperature Zone as shown below:
  (Oven Temp.) < (Needle Temp.) ≤ (Transfer Temp.) ≤ (GC Injection Port Temperature)
- The unit of pressure follows the <Configuration> - <GC> - <General> settings.
  However, since TurboMatrixHS is only the unit of kPa or psi, in the case of the other unit, it is set to kPa.

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. More than one sample can be analyzed continuously based on each setting condition.

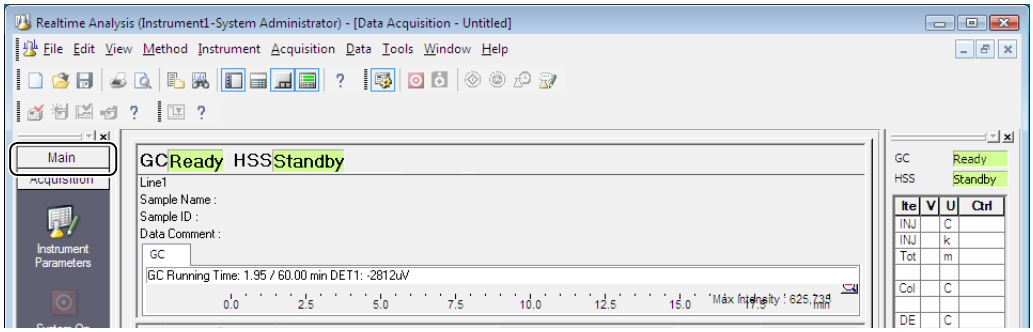
2.2.1 Preparing the batch table

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

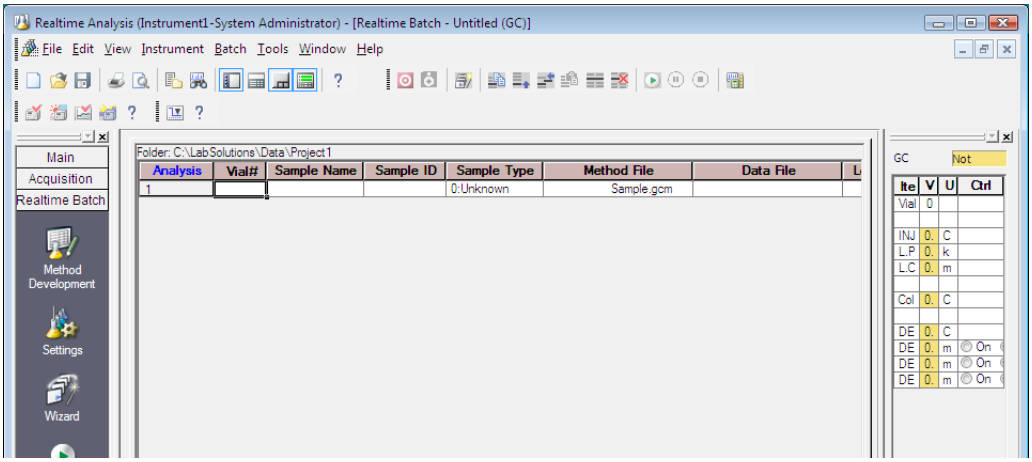


NOTE

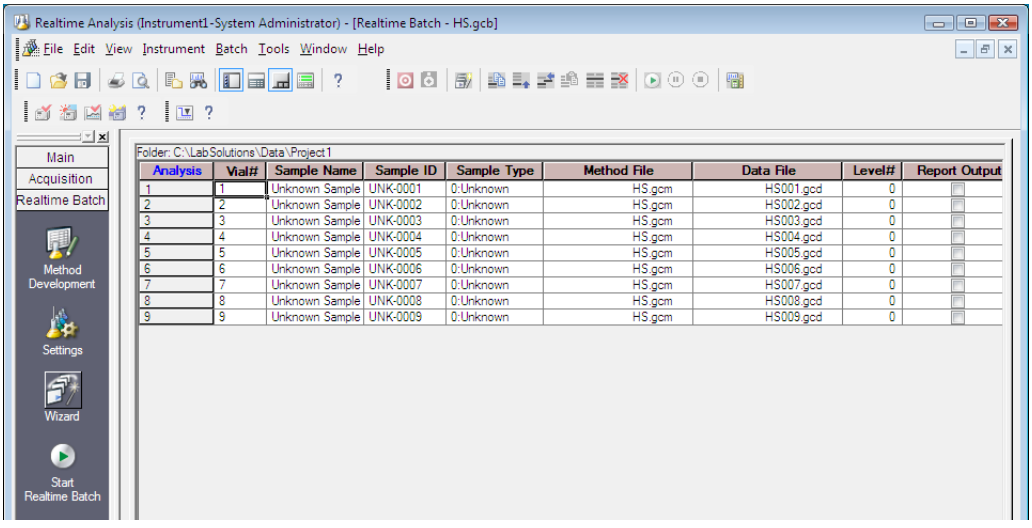
If the  (Realtime Batch) icon is not displayed, click Main on the title of the assistant bar.



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.
Set the Vial # in ascending sequence.

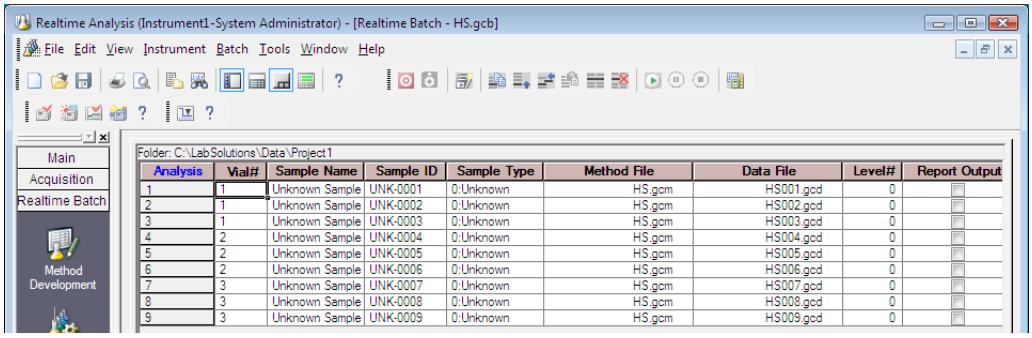


■ With the MHE mode

Use the method set in 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	TurboMatrix HS16: 1 - 16 TurboMatrix HS40: 1- 40 TurboMatrix HS110: 1-110	Set the vial number in ascending sequence. When the headspace mode is MHE, the same vial number be set up to 9 times.
Injection volume	-	The HS parameters are set in the method, so no entry can be made here.

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

The TurboMatrixHS operation mode may be selected from among the following 3 modes.

- Constant
- Progressive
- MHE

The vial number setting differs according to the operation mode. Set the vial number refering to the following examples.

■ Constant/Progressive

Set the vial numbers in ascending sequence.

Examples)

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

■ MHE

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.

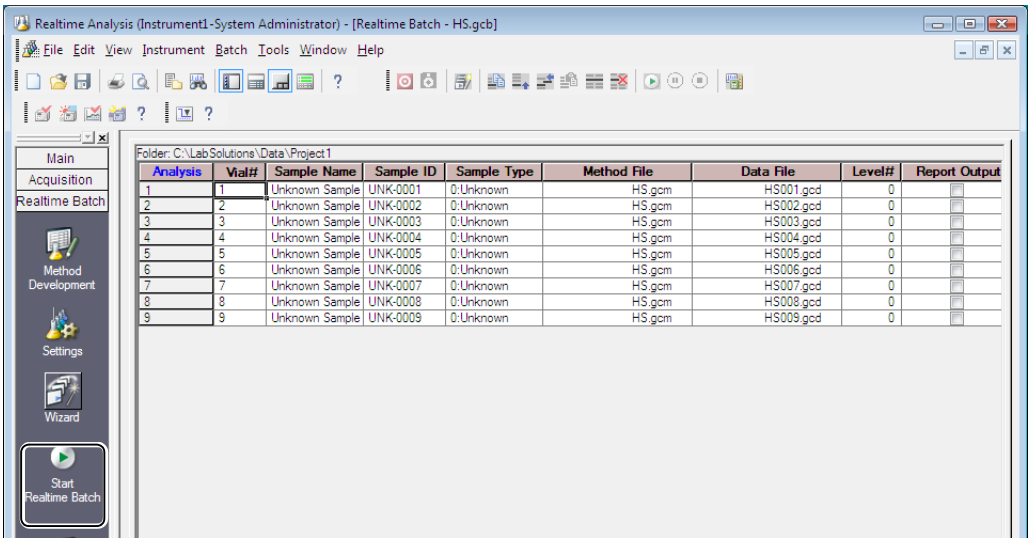
Examples)	Line Number	Vial #
	1	1
	2	1
	3	1
	4	2
	5	2
	6	2
	.	.
	.	.
		3 repeat elutions

NOTE

- When different HS parameters are set, an error is generated at the time of batch processing.
- When setting vial numbers, DO NOT skip numbers in the sequence. When any number is skipped, 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.



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

NOTE

While [Initializing] is displayed on [Instrument Status], please don't start analysis.

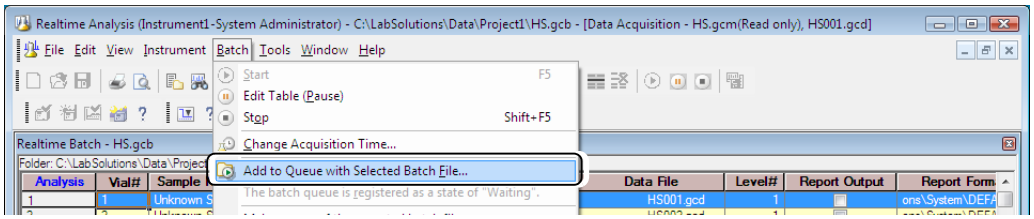
NOTE

For HSS analysis, partial execution and [Start Priority Batch] function are not available. Note that after batch analysis is stopped, it can restart only from the first row.

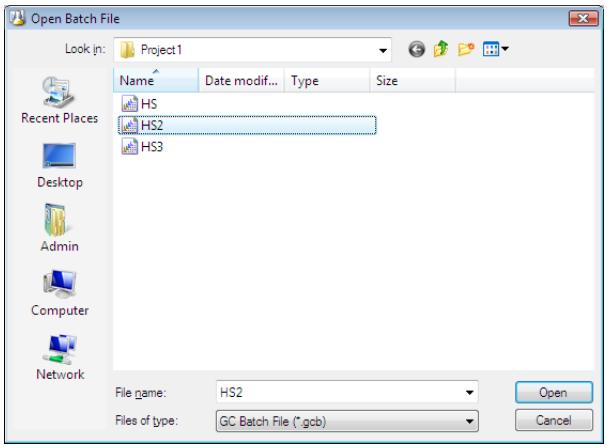
2.2.5 Running multiple batch files sequentially

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.