

Windows Software for Titrators

AT-Win

Operation Manual

Please read this manual thoroughly for the best performance and safety.


Ver. 14

59-00143-01

(A/N 98-595-0312)

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1. Introduction

1-1. Outline of the system

We appreciate your patronage over KEM products by purchasing the AT-Win Windows software for titration. The AT-Win enables your personal computer to control KEM's automatic potentiometric titrators e.g.; AT-700, AT-510, AT-500N or AT-420N. When this software is installed, your PC does not only control titration by starting or resetting the unit but also can set up titration parameters and configure measurement conditions for your sample materials. Please read this manual thoroughly for the best performance and safety of the system before actual use of the software.

[Features]

1. Security (operational limitation) per person can be defined.

The security is made possible by identifying operator's code and password, and the operator can work in the limited range of job so that the preset parameters can be secured in memory without being changed by someone else without knowing such personal error.

2. Navigation (measurement condition setup support) is now available.

This function automatically configures measurement conditions by just entry of sample type, analytical objective and measurement range. Navigation supports your setting up measuring conditions in simple dialogue form.

3. Operational steps are shown on display

After measurement is started, messages appears on display one after another prompting the next step to follow like adding reagent, input of sample size, etc. Therefore, a complex procedure necessary for a particular analysis can be done without operational error.

4. Fully GLP conformed

Electrode and sensor	: notice of periodical calibration date, calibration past record
Burette validation	: notice of periodical validation date, record of burette validation, and notice of piston head change date
Check with standard substance	: notice of periodic check date, check record
Other function	: defined range of operation per operator, error record

5. Software compatible with other models

The AT-Win can be used in conjunction with AT-700, AT-510, AT-500N or AT-420 titrator, whichever is customer's choice to meet user's needs and budget.

6. Titration result viewer program is added

By installing a specially designed titration result viewer program in another computer connected by LAN, the endpoints of a titration can be simulated with re-calculation.

7. Full and versatile documentation is now available

The data which used to be only available in the titration unit is now opened in CSV format and can be used in other application tools like Microsoft Excel, Lotus 1-2-3, Microsoft Access or Microsoft Word.

8. Settings on Sample Changer (CHA) can be made by AT-Win

With AT-510 is connected, not only standard cleaning sequence but also user defined rinsing sequence can be set up. The user defined sequence is stored in a file, and thus different ways of cleaning are selective depending on the sample type.

9. Bar code reader can be used

With the bar code reader connected to PC, it is easy to input lot number or sample ID. The bar code reader is available in the market.

Note 1: This software works only on Windows 2000/XP/Vista (Home Basic, Business)/7(Home Premium, Professional)

Note 2: Windows, Excel, Word, Access, Internet Explorer and IE are the registered trade- marks of Microsoft Corporation, and Adobe and Acrobat are the registered trade-name of Adobe Systems Incorporated.

1-2. About the manual

Please keep this manual near your system so that you can easily access to the necessary information you are looking for while operating or preparing for measurement.

The below three boxed messages show the basic symbols of warning, caution and note that you will see in this manual from time to time:

1. Where there exists a danger of physical injury or even possible death:



Warning!

There exists the danger of physical injury or even possible death if the instruction is disregarded.

2. Where there exists a danger of property damage:



Caution!

There exists the danger of property damage if the instruction is ignored.

3. When there exists a possibility of failure of instrument performance:

Note:





**There exists the possibility of failure of instrument performance.
If ignored, warranty may not be covered.**

- It is prohibited to copy a part or all of this manual without authorization by copyright.
- If you should find any part in this manual not clear to understand or missing article, contact your local dealer or sales representative.
- Manufacturer will not be liable for any loss or damage directly or indirectly caused by use of the instrument or its consequences.
- This manual describes the use of instrument when operated as a standard model.
For use of a model with special feature or specification, please read the manual particular to it.

1-3. Safety symbols

Always observe these signs and instructions.

You must observe cautionary messages and warnings in order to protect yourself as well as prevent others from physical injury or property damages.

 Warning This symbol means "Danger of severe injury or possible death".	 This symbol means prohibition of an act.
 Caution This symbol means "Danger of injury or property damage".	 This symbol means mandatory.

About the place for installation

Avoid a place under any of the following conditions:

- Power sharing from a tap or near powerful motorized equipment
- Within strong electro-magnetic field
- Fluctuating power source
- Strong vibration
- Direct sunlight
- Sharp change in temperature
- Atmosphere of corrosive gas
- A place of high temperature or humidity

About the supplied CD-ROM

The AT-Win CD is not a music CD. Never use it in an audio player. Otherwise, it creates big noisy sounds, and may break the sound speaker of your player.

1-4. Symbols and rules of description in this manual

This manual is described according to the following rules.

Menu, Command, Dialog box, etc.

Symbols	Description
[Setup] menu	Menu name is surrounded with ([]).
[Sample] in [Setup] menu	A command name comes with its menu with ([]).
[Sample Setup] dialog box	The name of dialog box on title bar is surrounded with ([]).
[OK], [Cancel]	Command buttons are surrounded with ([]).
[AT-510]	Icon name is surrounded with ([]).

Symbol for the mouse

Symbols	Description
Click	Press mouse button and quickly release it.
Double click	Quickly press the mouse button twice.
Point	Move the mouse to the destination and overlap it.
Drag	Move the mouse while its button being pressed, and release at the destination.

Key operation

Symbols	Description
Enter	This key is expressed in bolt letter.
Alt + X	+ means a plural number of keys are pressed at a time. Alt + X means Press X key while Alt key is being pressed.

1-5. Key configuration chart

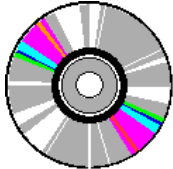

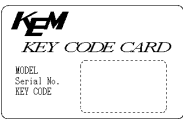

The key configuration in this manual is based on the following arrangement. If the key board of your PC is different from these, refer to the manual of your PC like Windows.

Symbols	101 key board
ESC	[ESC]
Tab	[Tab [↔]]]
Ctrl	[Ctrl]
CapsLock	[Caps Lock]
NumLock	[Num Lock]
Shift	[↑ Shift]
Alt	[Alt]
Space	[]
Enter	[Enter ↵]
BackSpace	[Backspace]
Ins	[Insert]
Delete	[Delete]
Home	[Home]
End	[End]
PageDown	[Page Down]
PageUp	[Page Up]
F1 - F10	[F1] - [F10]

2. Before use

2-1. Unpacking and checking supplied parts

The carton box contains AT-Win software CD, accessories, manual, etc. Check the supplied parts according to the below list.

Part Number	Part name	Qty	sketch
12-03152	CD (AT-Win software) (Operation manual)	1	
12-02012	Connecting Cable(9P-9P)	1	
—	Key code card	1	
59-00116-01	Installation manual	1	

2-2. Install and uninstall the program

2-2-1. Install and Uninstall AT-Win software

2-2-1-1. Install the program

- 1) Turn on the power of your PC and activate Windows. You have to log in the name of the user (Ex. Administrator) who is authorized to access to the Windows with software.
- 2) Insert the CD of AT-Win into the CD drive. The install program will activate automatically. When activated, refer to the step 5. If it does not activate, refer to step 3.
- 3) Double click on [My Computer], and double click on CD drive.
- 4) Double click on [Setup.exe].
- 5) The install program is shown on display. Proceed installation following the messages.
- 6) After installation is completed, [KYOTO ELECTRONICS] will be added to [Program] group. The program starts from here.



Caution!

If an old software (AT-420-WIN, AT-420N-WIN, etc.) was installed, install the AT-Win in other folder than these already used for them.

The folder to which the AT-Win is installed should be the folder where the file operation is not restricted.

Ex. OK: c: ¥KYOTO ELECTRONICS¥AT-Win¥

NG: c: ¥Program files¥KYOTO ELECTRONICS¥AT-Win¥

c: ¥WINNT¥KYOTO ELECTRONICS¥AT-Win¥

c: ¥Windows¥KYOTO ELECTRONICS¥AT-Win¥

2-2-1-2. Uninstall the program

- 1) Click on [Start] - [Settings] - [Control Panel] on windows tool bar.
Double click on the icon of [Add/Remove Programs].
- 2) Select AT-Win on the list and click on [Add/Remove].
- 3) The un-installation will start. Proceed the steps following the display.
- 4) Make sure there is no file remaining in the folder where the titration program was installed. Click [OK] button to finish the un-installation.

2-2-2. Install and Uninstall Viewer program

2-2-2-1. Install the Viewer program

- 1) Turn on the power of your PC and activate Windows. You have to log in the name of the user (Ex. Administrator) who is authorized to access to the Windows with software.
- 2) Insert the CD of AT-Win into the CD drive. The install program will activate automatically. When activated, refer to the step 3. If it does not activate, refer to step 5.
- 3) Click on [Cancel] button when [Install Shield Wizard] dialog box appears.
- 4) When [Cancel Setup] dialog box appears, check on its contents, and click on [Yes] button.
- 5) Double click on [My computer], click on CD drive, and right-click.it. When the menu appears, select [Open].
- 6) Double click on [Viewer] folder.
- 7) Double click on [Setup.exe].
- 8) The install program is shown on display. Proceed installation following the messages.
- 9) When the installation of the Viewer is completed, [AT-Win ER Viewer] will be added to the [KYOTO ELECTRONICS] group in the [Programs] group.

Note:

During the install program is working, if you should have changed a directory for setup, the above description may not apply.

2-2-2-2. Uninstall the Viewer program

- 1) Click on [Start] - [Settings] - [Control Panel] on windows tool bar.
Double click on the icon of [Add/Remove Programs].
- 2) Select AT-Win Viewer on the list and click on [Add/Remove].
- 3) The un-installation will start. Proceed the steps following the display.
- 4) Make sure there is no file remaining in the folder where the Viewer program was installed. Click [OK] button to finish the un-installation.

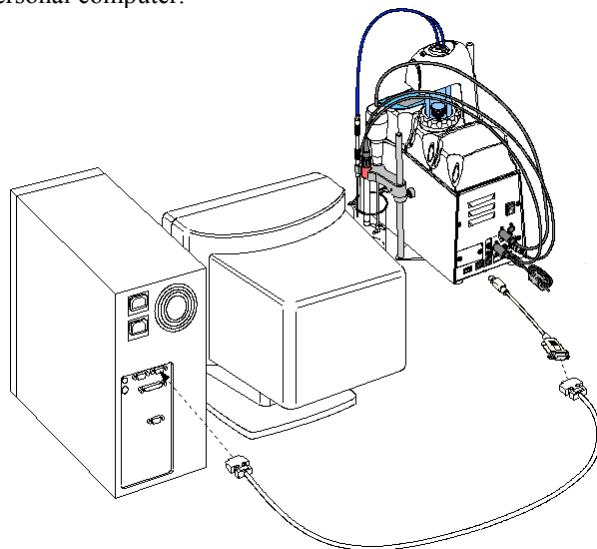
2-3. Connecting the titrator

2-3-1. Connecting cable

The titration is controlled by AT-Win through RS-232C serial communication interface.

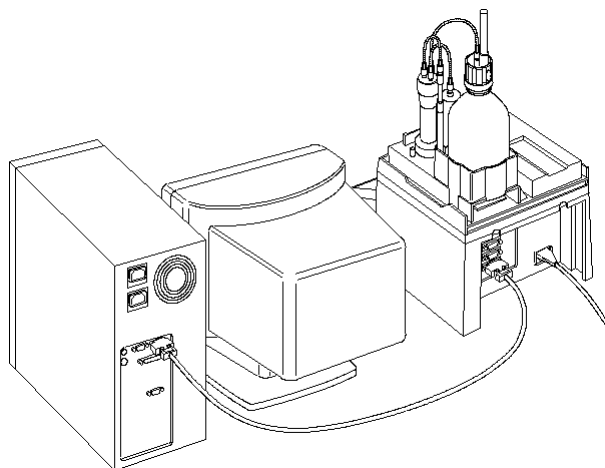
Connecting AT-700

Connect the connection cable (MiniDIN8P-DSUB9P) (64-00625) to the COM connector on the back of the titrator ("A"), and connect the connection cable (9P-9P) (12-02012) to "A" ("B"). Then connect "B" to the COM port of your personal computer.



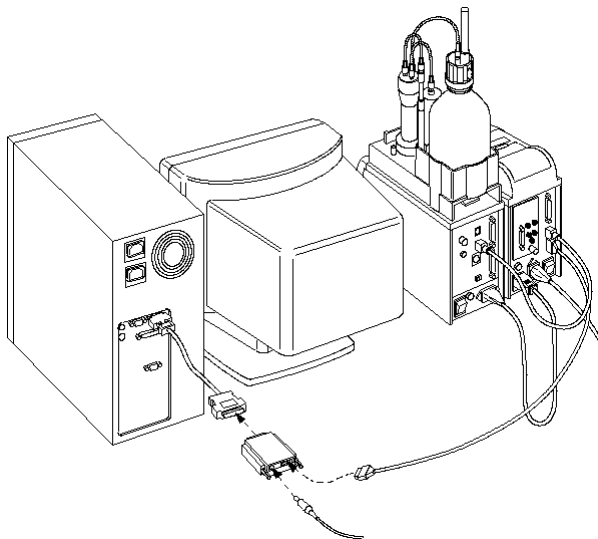
Connecting AT-510 or AT-500N

Using the supplied cable, connect RS-232C port on the back of titrator and COM port of PC.



Connecting AT-420

Plug in the optical cable to H-bus connector of the back of titrator and the other end of cable to RS-232C optical module (98-350-0002). The connecting cable (98-030-0005) is connected here. Connect the other end of cable to COM port of PC.



Note:

If COM ports are not enough, add another port or more ports if necessary.
For additional COM port, refer to 2-3-2. Allocation of COM port.



Caution!

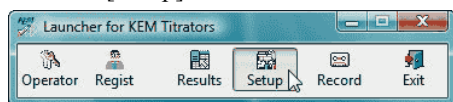
COM1 to COM 10 are available. Do not use COM port 11 or more.

2-3-2. Allocation of COM port

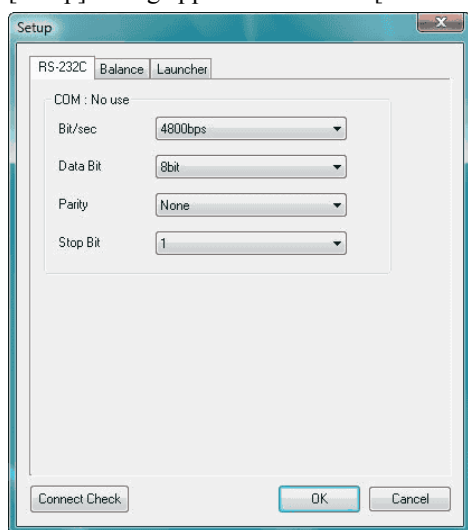
To connect the AT-Win to a titrator, it is necessary to set up communication protocol with Launcher program.

To activate the Launcher program, click on [Start] button, and point [Program]. Then, click on [AT-WIN] in [AT-WIN Launcher] group in [KYOTO ELECTRONICS] group.

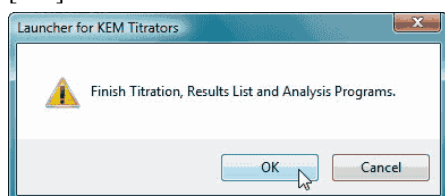
Click on [Setup] button.



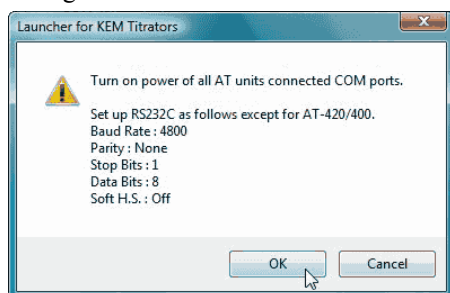
[Setup] dialog appears. Click on [Connect Check] on the dialog.



When below message appears, close programs except AT-Win Launcher. When those programs are closed, click on [OK] button.



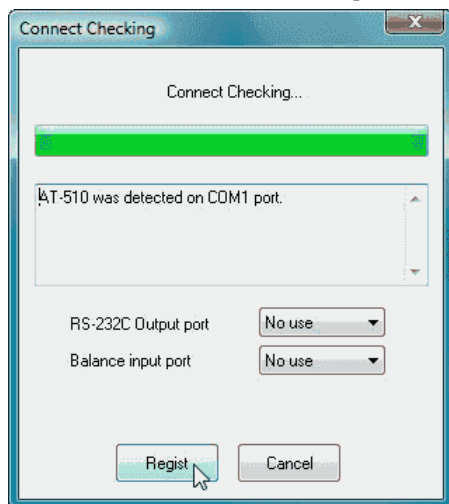
When below message appears, turn on the power of the titrator to be connected. Set the digital configuration for RS-232C communication interface of the titrator according to the below settings.



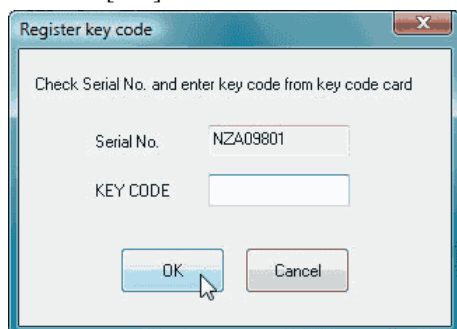
Note:

For the communication protocol for the titrator itself, refer to its manual.

Make sure of the connection on [Connect Checking] dialog box. Click on [Register] button.

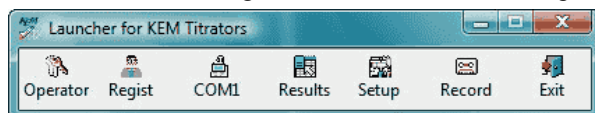


After the connection is confirmed, [Register key code] dialog box appears. Enter the supplied key code. Click on [OK] button.

**Note:**

The key code is an individual number based on production serial number of the unit. Do not lose the key code. It is important.

When the titrator is registered at COM 1, Launcher program will show as below.



For the meaning and operation of each button, refer to 3-2. About Launcher program.

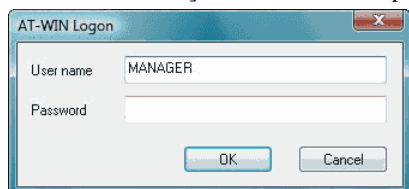
3. Basic procedure of operating the system

3-1. Steps for basic operation

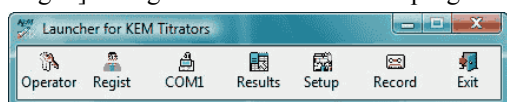
3-1-1. Start and finish the program

Activate Launcher program

Click on [Start] button and point [Program]. Then, click on [AT-Win]-[AT-Win Launcher] from [KYOTO ELECTRONICS] to start Launcher program. When AT-Win is activated, [AT-Win Logon] dialog box appears.



Enter “MANAGER” for user name. With password kept in blank, click on [OK] button. Close [AT-Win Logon] dialog box to show Launcher program.

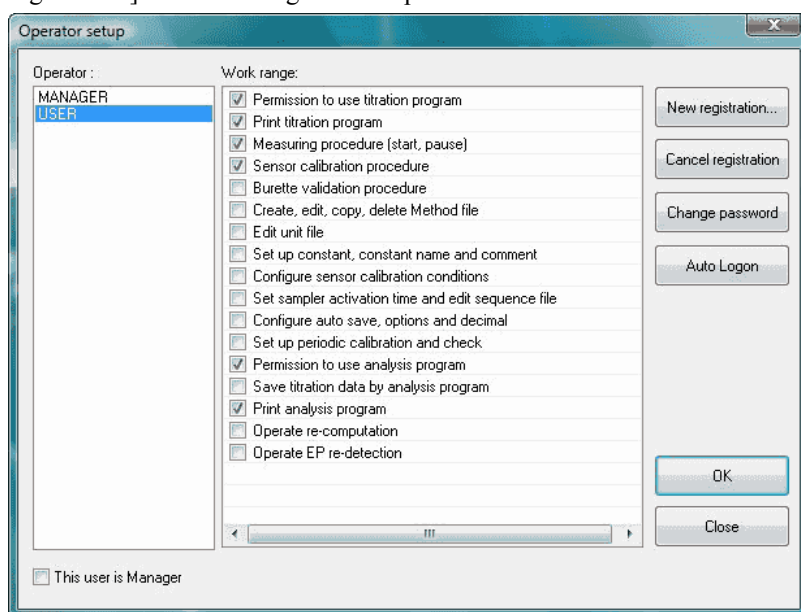


Note:

When automatic logon is preset, [AT-Win Logon] dialog box does not appear. As to the automatic logon, refer to 3-2-2. [Regist] button and 3-2-2-1. Auto logon. The default setting in plant before shipment is the automatic logon is set in MANAGER.

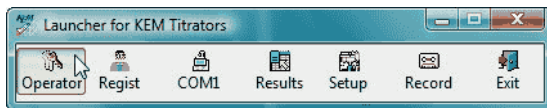
Register the operators

Click on [Regist] button on Launcher program. Open [Operator setup] dialog box. Click on [New registration] button and register the operator.

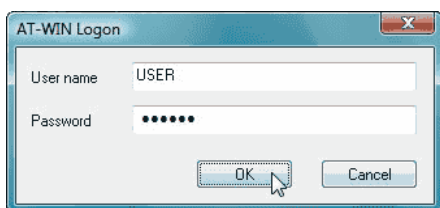
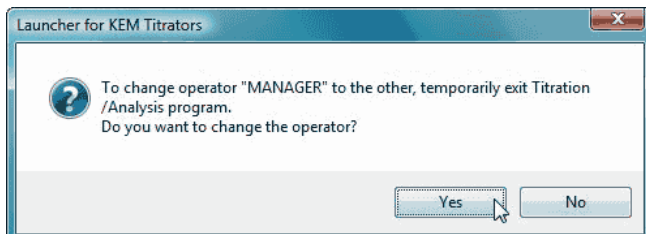


Change the operator

Click on [Operator] button in Launcher program.



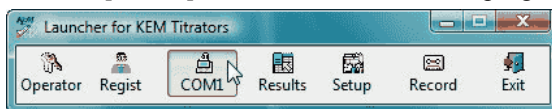
The warning message appears. Click on [Yes] button to show [AT-Win Logon] dialog box.



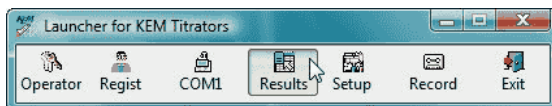
Activate the program

On Tool bar screen, click on the program button to activate it.

Click on [COM1] button to activate titration program for which [COM1] is allocated.

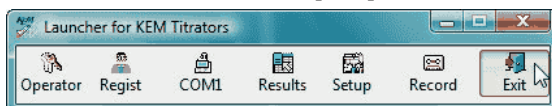


To show the results data list. Click on [Results] button.



Exit the program

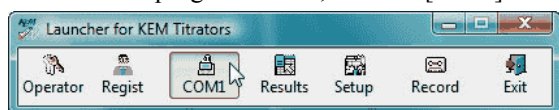
On Tool bar screen, click on [Exit] button to finish all of AT-Win programs.



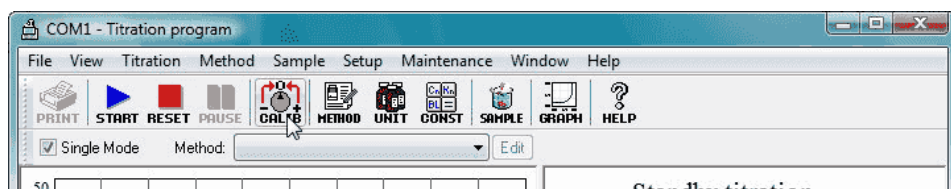
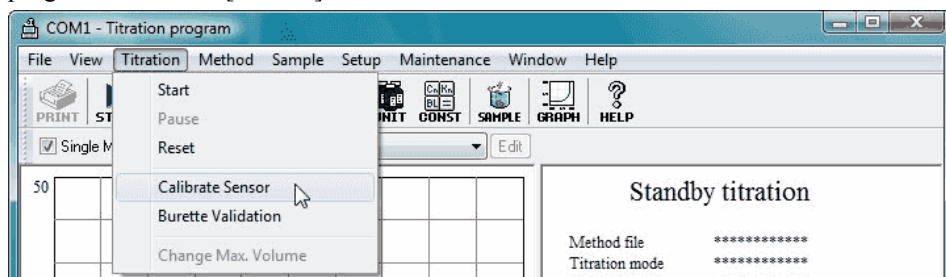
3-1-2. Preparation before titration starts

3-1-2-1. Calibrate sensor (electrode, etc.)

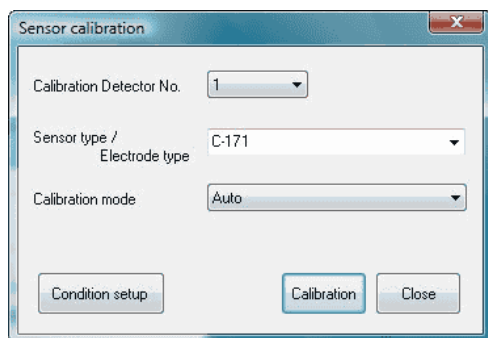
On Launcher program screen, click on [COM] allocated for titration program.



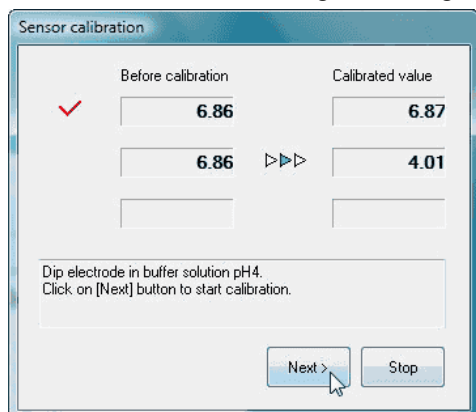
Activate the titration program. Click on [Calibrate Sensor] command on [Titration] menu of titration program or click on [CALIB] button on tool bar.



Select a detector number, the electrode (sensor) to be used and calibration method. Click [Calibration] button to start calibration.

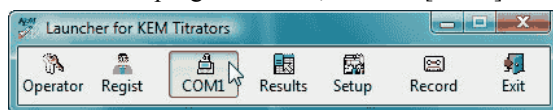


Proceed to calibrate following the messages on display.

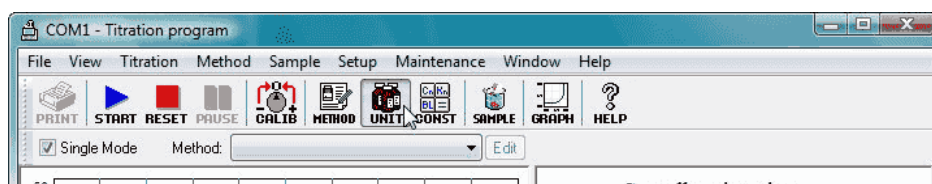
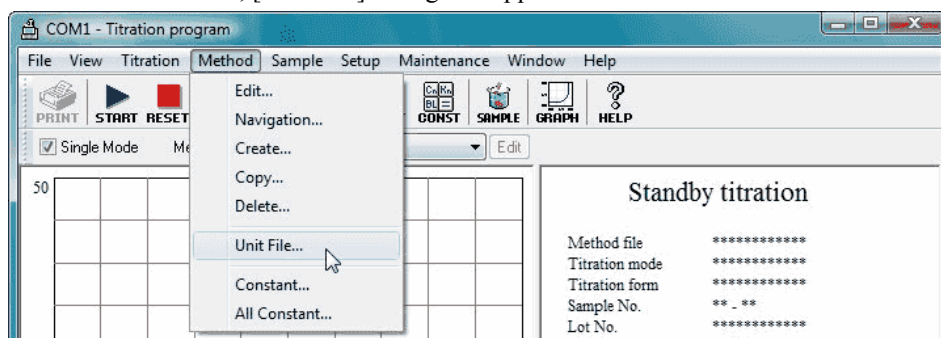


3-1-2-2. Prepare information on reagent

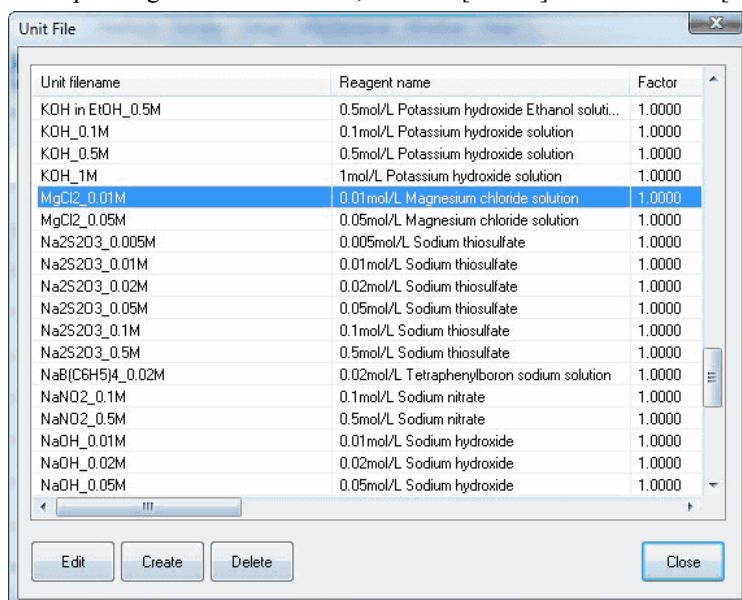
On Launcher program screen, click on [COM] which is allocated for titration program.



Click on [Unit File...] command from [Method] menu of titration program or [UNIT] button on tool bar. When this command is executed, [Unit File] dialog box appears.



Point the cursor the unit file of reagent to be edited from the unit file list, and click on [Edit] button. If there is no corresponding unit file in the list, click on [Create] button to show [Edit Unit File] dialog box.



Enter reagent name, factor (titer), constant, etc.

Edit Unit File

Unit filename: [CH3]4NOH in MeOH_0.1M

Reagent name: 0.1mol/L Tetramethylammonium hydroxide in Methanol_solution

Factor: 1 Temp. comp. coefficient A: 1.1824

Remaining reagent: 1000 mL Temp. comp. coefficient B: -0.2527

Alarm setting

☒ Lowest volume of reagent less than 50 mL

☒ Next reagent replacement day 1/10/2002 Update 7 Day

☒ Next piston replacement day 1/10/2002 Update 7 Day

☒ Next capacity validation day 1/10/2002 7 Day

Auto update interval: 7 Day

Buttons: OK, Cancel, Print, Constant

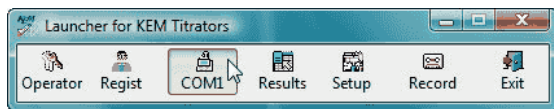
Note:

For details of unit file, see 3-3-4-6. [Unit File] command.

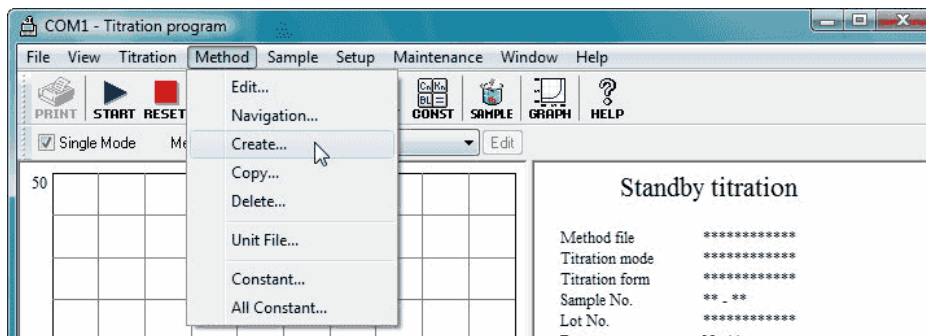
3-1-3. Basic operating procedure before titration starts

3-1-3-1. Measurement conditions (Method file) setup

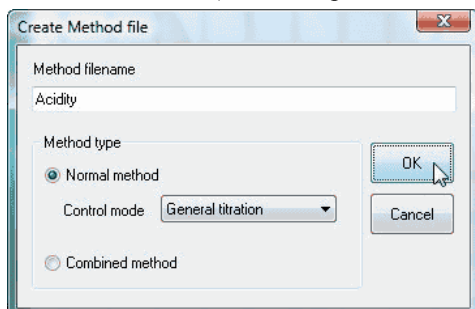
On Launcher program screen, click on [COM] button allocated for titration program. The program will start.



Click on [Create...] command from [Method] menu.



When [Create Method file] dialog box appears, enter a new Method filename. Then, select Normal method or Combined method (the below picture shows the case of normal method), and click on [OK] button.



Note:

<Normal method>

This is the method for one titration for a single sample material.

<Combined method>

This is the method for a plural number of titration for the same sample. (e.g.: After acid-base titration with sodium hydroxide, proceed to precipitation titration with silver nitrate solution)

Note:

The combined method cannot be used on the titration programme where AT-700 is connected.

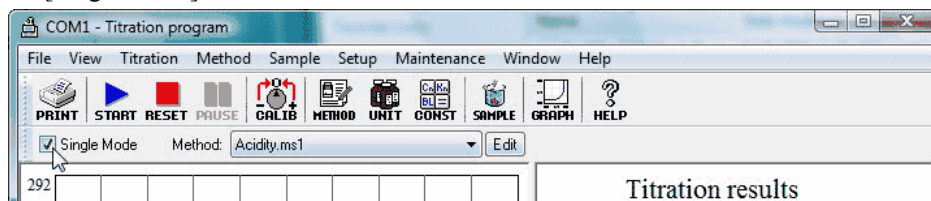
If Normal method is chosen, the dialog box [Edit Method File] appears. Here, you select and enter parameters like volume for titration/fixed dose, control, etc. Click [Save] button to save the Method file. For details of each parameter setup, see 3-6. About Method File.

When Combined method is chosen, the dialog box [Edit Combined Method File] appears. Here, you select the normal method files to combine. Click [Save] button to save the method file.

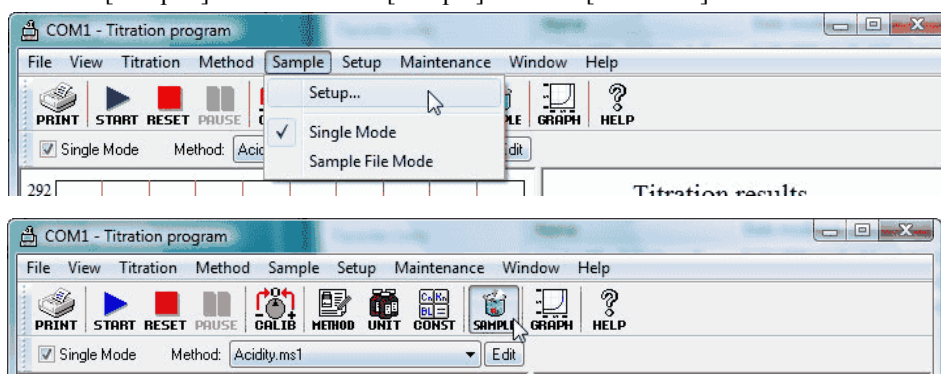
3-1-3-2. Sample conditions setup

Sample conditions setup is available for three-types modes (Single mode, Sample file mode and Changer mode). Single mode is for one sample measurement while Sample file mode is used for measurement with a multiple sample changer connected or when sample conditions are reserved.

To select Single mode, check [Single Mode] check box on toolbar, and to select Sample file mode, simply check off [Single Mode] check box.

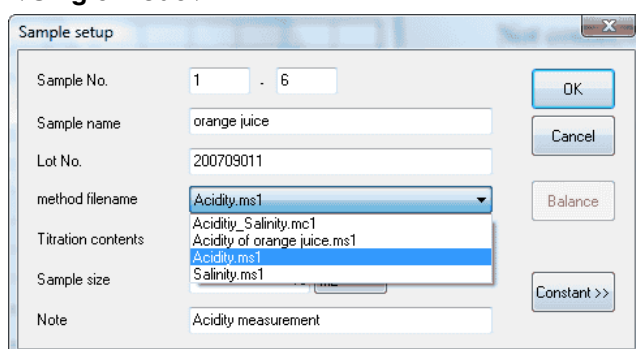


Click on [Setup...] command from [Sample] menu or [SAMPLE] button on toolbar.



[Sample setup] dialog box appears. Make settings for sample condition. Click [OK] button to close. The below display shows Method filename is being selected.

< Single mode >



< Sample file mode >

Sample setup

Max number of samples: 10 Sample changer: None

Titration sample No.: 1 Sequence mode: Standard1

Sampling unit: mL Rinse sequence at start:

Cursor direction: Under Rinse sequence at the end:

No.	High No.	Low No.	Sample name	Lot No.	Sample Size	Method File	Titration co
1	1	1	orange juice	20070911	10.0000	Acidity.ms1	Samp
2	1	2	orange juice	20070911	10.0000	Acidity.ms1	Samp
3	1	3	orange juice	20070911	10.0000	Salinity.ms1	Samp
4	1	4	orange juice	20070911	10.0000	Acidity_Salinity.mc1	Samp
5	1	5	orange juice	20070911	10.0000	Acidity.ms1	Samp
6	1	6	orange juice	20070911	10.0000	Acidity.ms1	Samp
7	1	7	orange juice	20070911	10.0000	Acidity.ms1	Samp
8	1	8	orange juice	20070911	10.0000	Acidity.ms1	Samp
9	1	9	orange juice	20070911	10.0000	Acidity.ms1	Samp
10	1	10	orange juice	20070911	10.0000	Acidity.ms1	Samp

Buttons: Open, Save, Add, Insert, Delete, Renumber, Balance, Print, OK, Cancel

< Changer mode >

Changer Mode

Sampling unit: g Shower: 10 sec Start Mode: 1

Cursor direction: Right Rinse: 10 sec

Drain: 20 sec

No.	High No.	Low No.	Sample name	Lot No.	Sample Size	Method File	Titration co
1	1	1			5.0000	Acidity.ms71	Samp
2	1	1			5.0000	Acidity.ms71	Samp
3	1	1			5.0000	Acidity-Salinity.ms71	Samp
4	1	1			5.0000	Acidity.ms71	Samp
5	1	1			5.0000	Acidity.ms71	Samp
6	1	1			5.0000	Acidity.ms71	Samp

Buttons: Open, Save, Renumber, Balance, Print, OK, Cancel

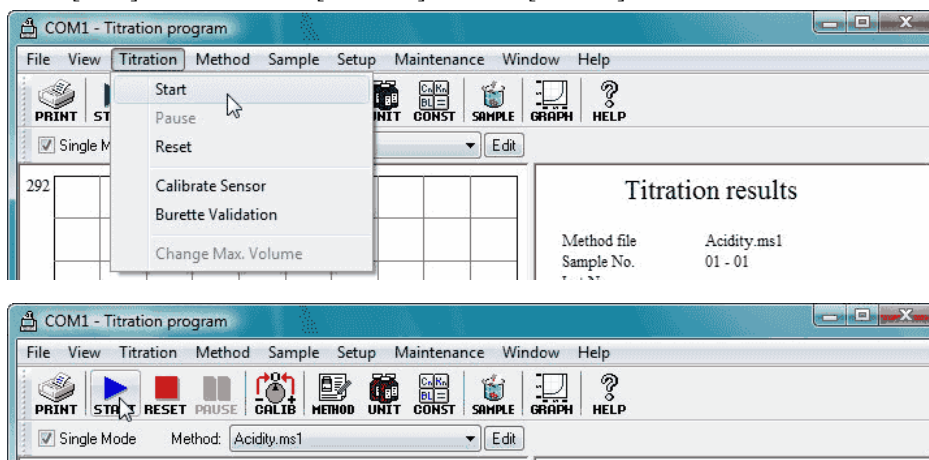
Note:

The changer mode cannot be used on the titration programme where AT-510, AT-500N or AT-420N is connected.

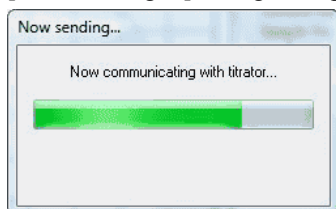
3-1-3-3. Start, pause and abort titration

< Start titration >

Click [Start] command from [Titration] menu or [START] button on toolbar.

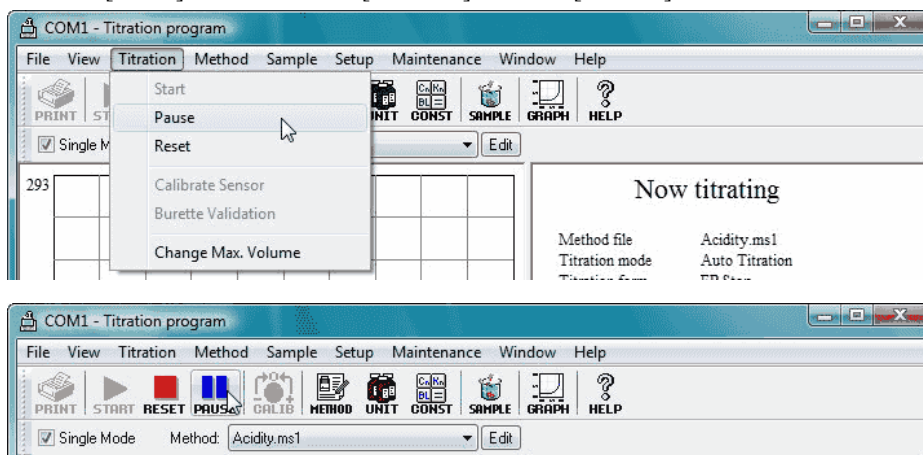


[Now sending...] dialog box appears and the parameters will be transferred to titrator.



< Pause titration >

Click on [Pause] command from [Titration] menu or [PAUSE] button on toolbar.



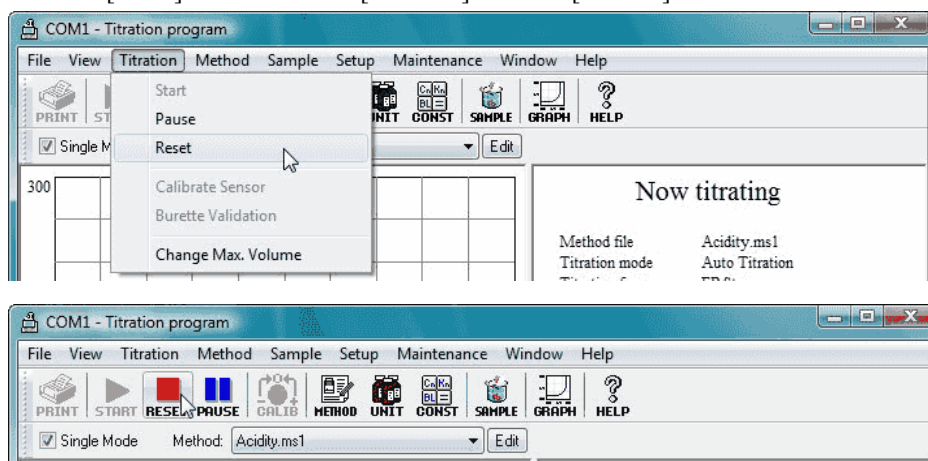
To resume titration, click again on [Pause] command from [Titration] menu or [PAUSE] button on toolbar.

Note:

Pause cannot be used on the titration programme where AT-700 is connected.

< Abort titration >

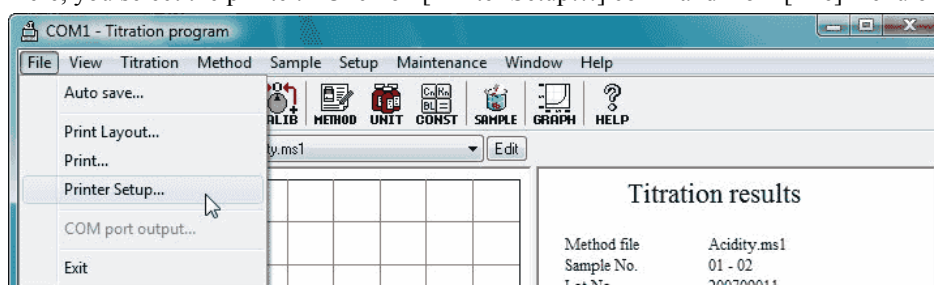
Click on [Reset] command from [Titration] menu or [RESET] button on toolbar.



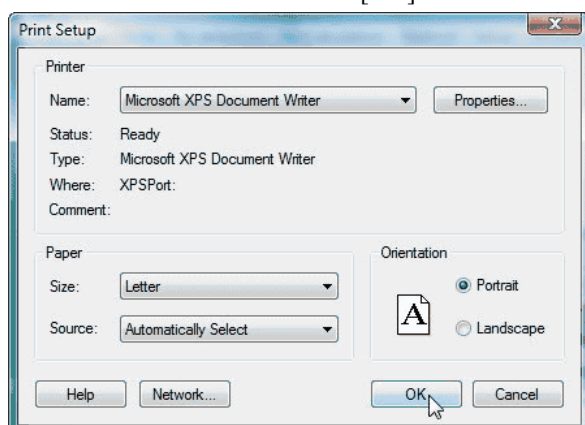
3-1-3-4. Print out titration data

< Printer setup >

Here, you select the printer. Click on [Printer Setup...] command from [File] menu of titration program.



The display shows [Print Setup] dialog box. Select the printer, set the printed paper size at 'A4' or 'Letter' in the Portrait orientation and click the [OK] button.

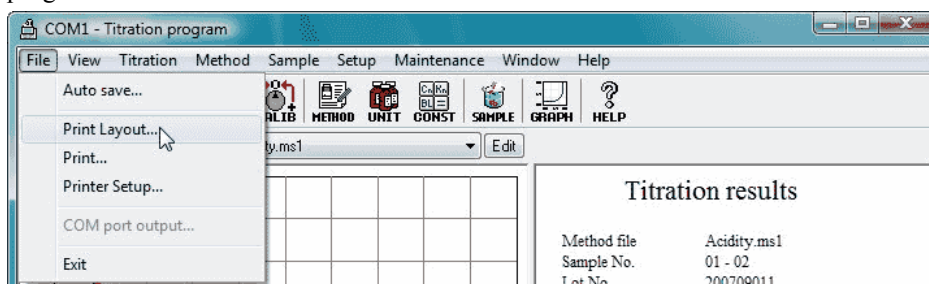


Note:

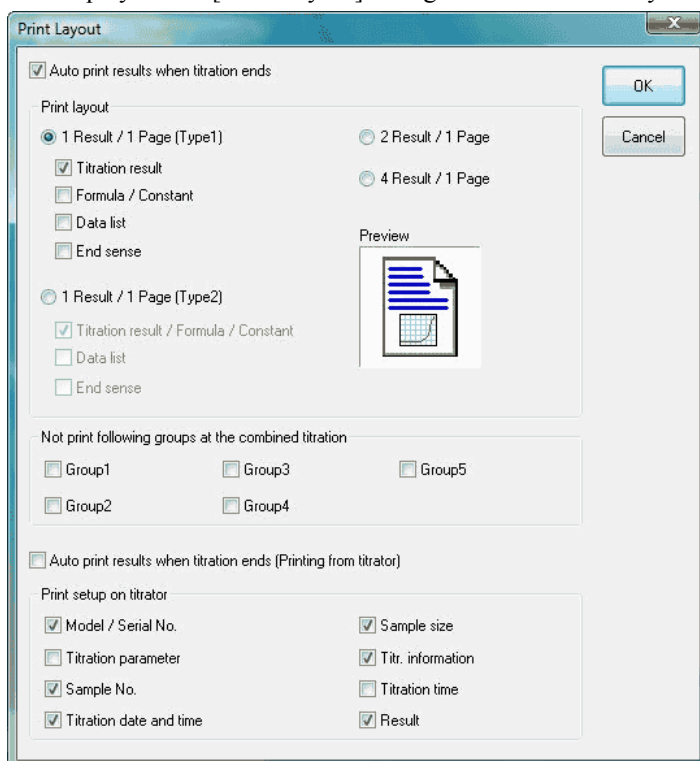
For details of printer setup, see 3-3-1-4. [Printer Setup] command.

< Print Layout >

Here, you select how to print the data. Click on [Print Layout...] command from [File] menu of titration program.



The display shows [Print Layout] dialog box. Select the layout of printing.



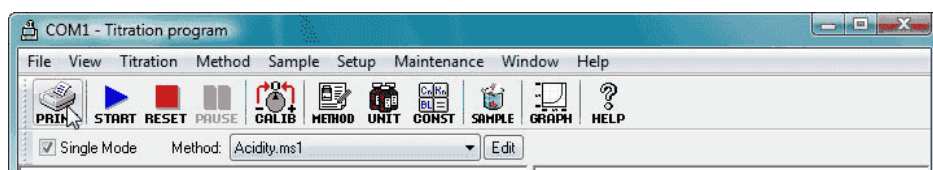
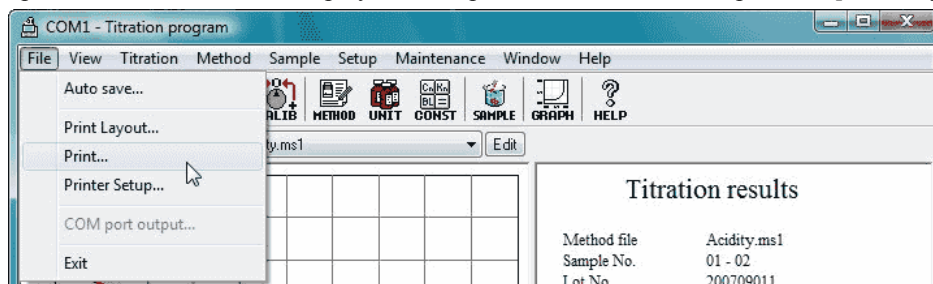
For printing automatically after measurement is over, check [Auto print results when titration ends].

Note:

For printing setup, see 3-3-1-2. [Print Layout] command.

< Manual printing >

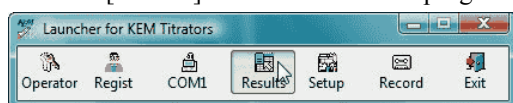
Click on [Print...] command from [File] menu of titration program or on [PRINT] button on tool bar. The data up to the results shown on display now are printed out in the format preset in [Print Layout] dialog box.



3-1-4. Process titration data

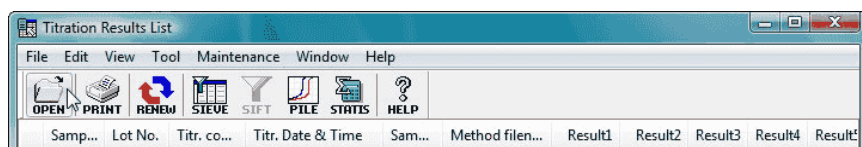
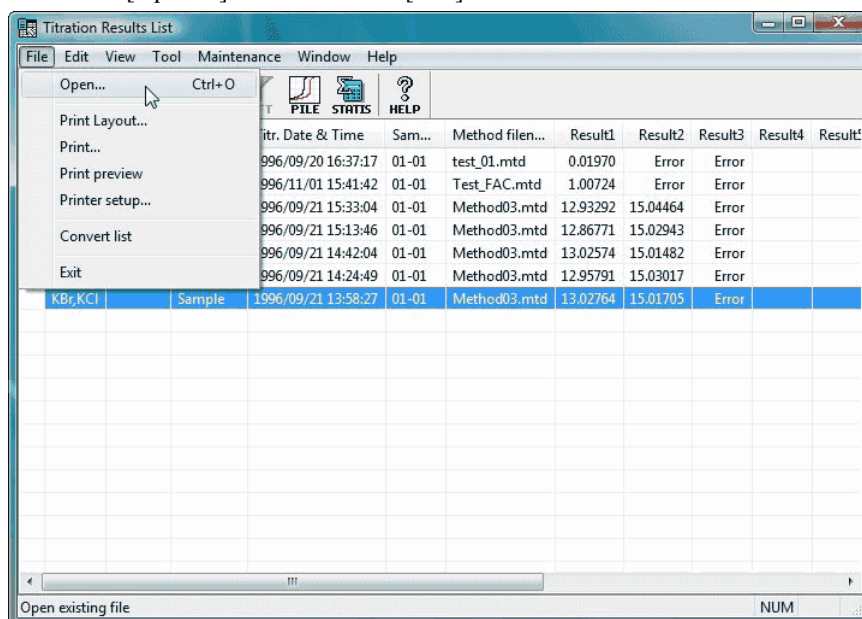
3-1-4-1. Re-calculate titration data

Click on [Results] button on Launcher program. The program for the list of results will be activated.

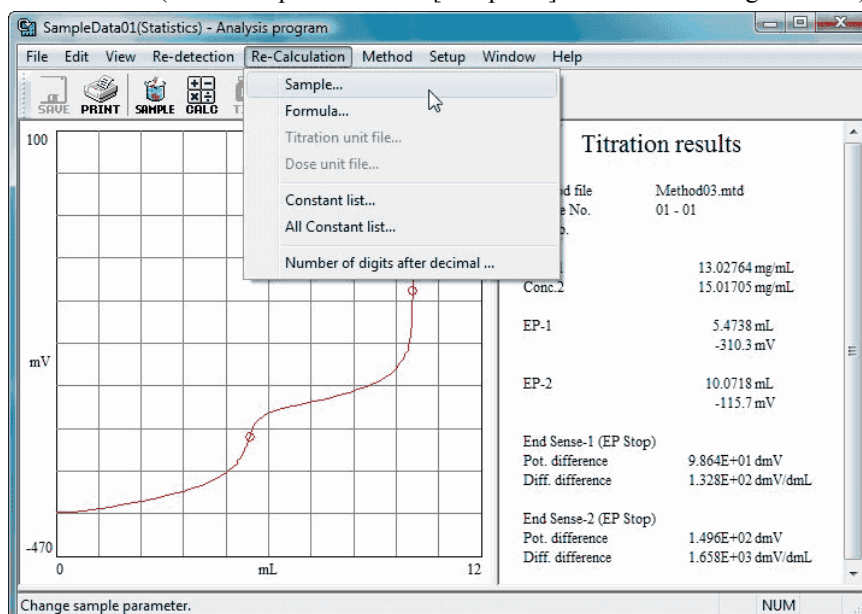


Click on [Refresh...] from [View] menu to update the list of results.

When the display shows the list, select the titration data you want to re-calculate. Click on [OPEN] button on tool bar or [Open...] command from [File] menu.




The analysis program will start for the selected titration data. Click on [Re-Calculation] command for recalculation. (the below picture shows [Sample...] command is being selected.)



When a command on [Re-Calculation] menu is clicked on, the corresponding dialog box appears. Here, you make necessary changes. When [Re-Calculation] button is clicked on, the re-calculated data appears. The below example shows [Sample] command is clicked on and the sample size has been changed.

< Recalculation by changing sample setup >

A screenshot of a 'Sample setup' dialog box. It contains several input fields: 'Sample No.' with '1' and '1' in sub-fields, 'Sample name' with 'KBr,KCl', 'Lot No.' (empty), 'method filename' with a dropdown showing 'Method03.mtd', 'Titration contents' with 'Sample', 'Sample size' with '5' and a unit dropdown showing 'g', and 'Note' with 'M-214 R-211'. On the right side, there are three buttons: 'Re-Calculate', 'Cancel', and 'Constant >>'.

Sample No.	1	.	1	Re-Calculate
Sample name	KBr,KCl			
Lot No.				Cancel
method filename	Method03.mtd			
Titration contents	Sample			Constant >>
Sample size	5	g		
Note	M-214 R-211			

Note:

For details of each re-calculating command, see 3-5-5. [Re-Calculation] menu.

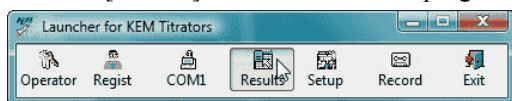
Clicking [Save] command in the [File] menu will allow you to store the data as re-calculated results. At this time, the [Comment setup] dialog box will appear, please input the reason for updating and the like.

Note:

Please be sure to input comments. The data cannot be saved without inputting comments.

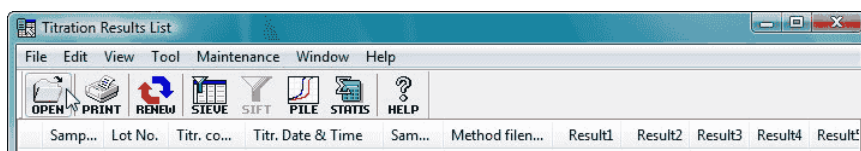
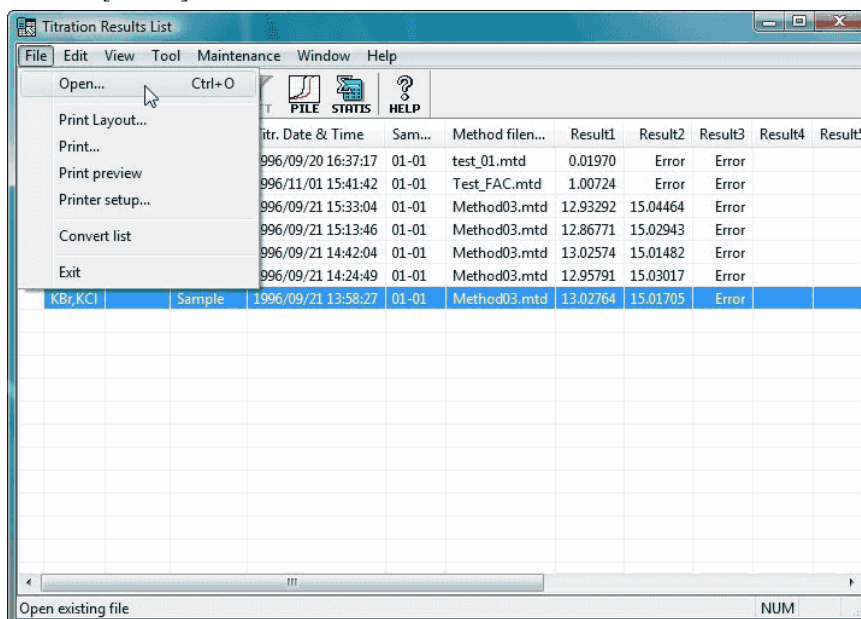
3-1-4-2. Re-detection the endpoint on titration data

Click on [Results] button on Launcher program. The results list program starts.

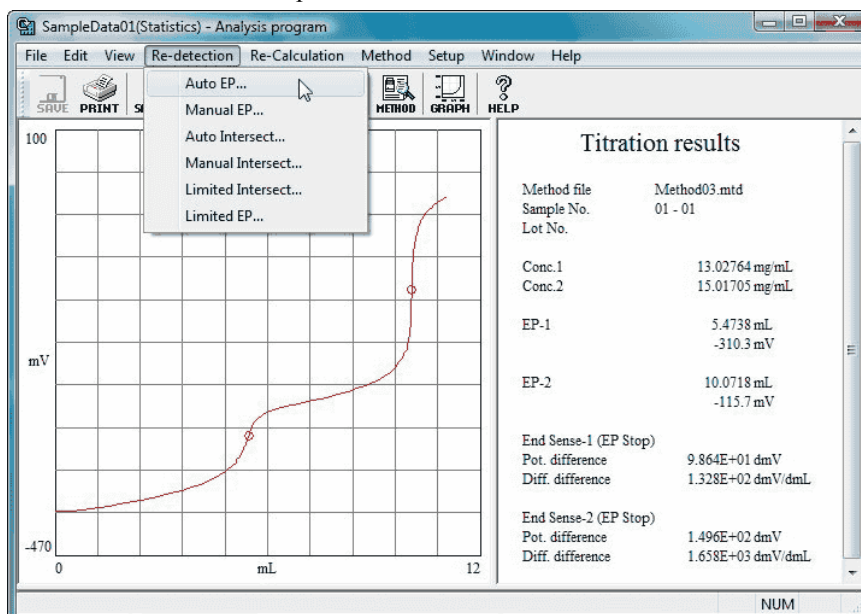


Click on [Refresh...] command from [View] menu.

When the list of titration data is shown, select the data for re-detection. Click on [Open...] command from [File] menu or [OPEN] button on tool bar.

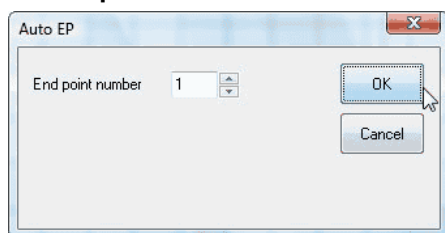


The analysis program starts for the selected titration data. Click on the command from [Re-detection] menu to execute re-detection of endpoint.



When a command from [Re-detection] menu is clicked on, each corresponding dialog box appears for re-detection of endpoint. When [OK] button is clicked on, the recalculated data will be shown.

< example. Auto EP >



Note:

For details of re-detection of endpoint, see 3-5-4. [Re-detection] menu.

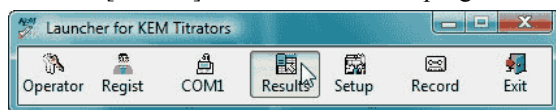
Clicking [Save] command in the [File] menu will allow you to store the data as re-calculated results.
At this time, the [Comment setup] dialog box will appear, please input the reason for updating and the like.

Note:

Please be sure to input comments. The data cannot be saved without inputting comments.

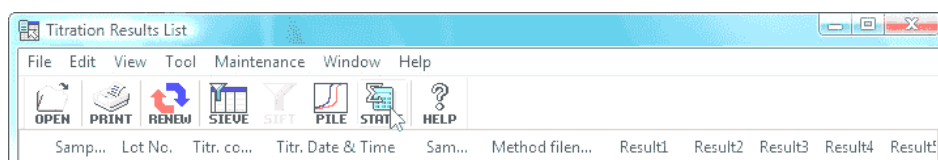
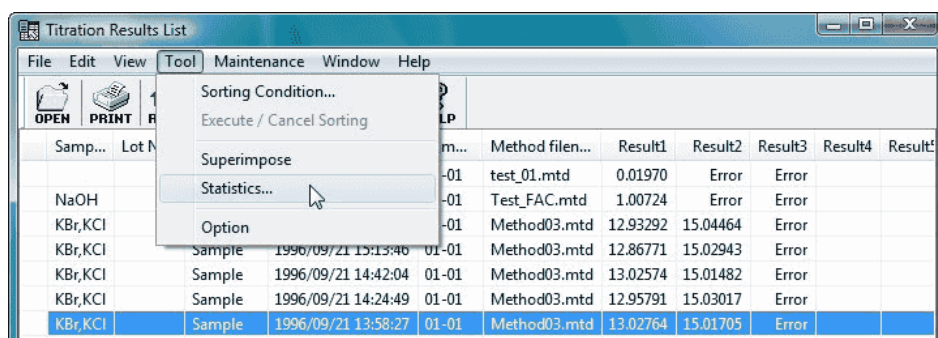
3-1-4-3. Batch calculating data

Click on [Results] button on Launcher program. The results list program starts.

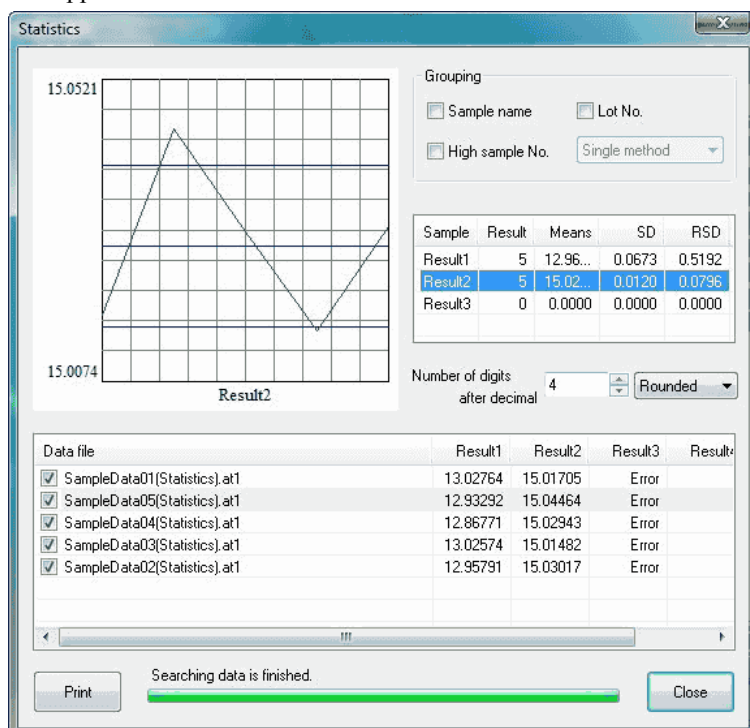


Click on [Refresh...] command from [View] menu.

Select the data for batch calculation on the list. Click on [Statistics...] command from [Tool] menu or [STATIS] button on tool bar.



The selected data and the data obtained under the same conditions will be batch calculated. [Statistics] dialog box appears.

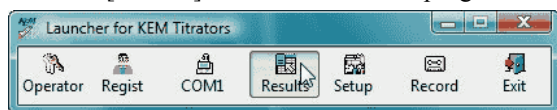


Note:

For details of statistical calculation dialog box, refer to 3-4-4-4. [Statistics] command.

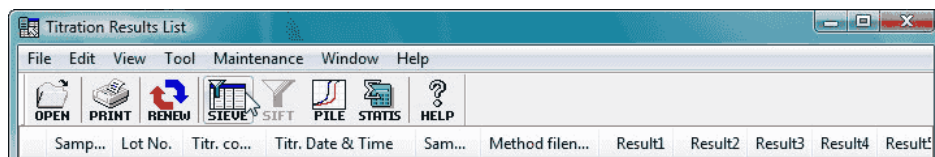
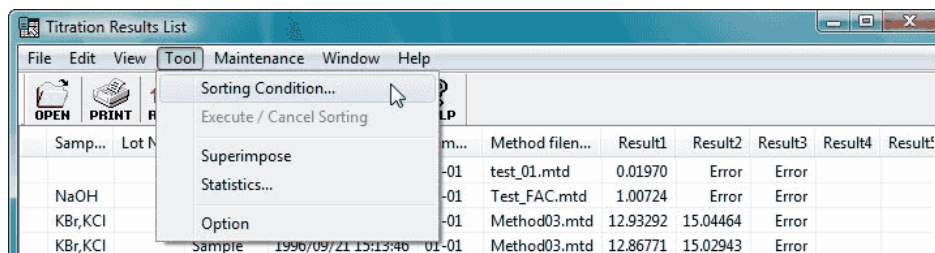
3-1-4-4. Superimpose titration data

Click on [Results] button on Launcher program. The results list program starts.

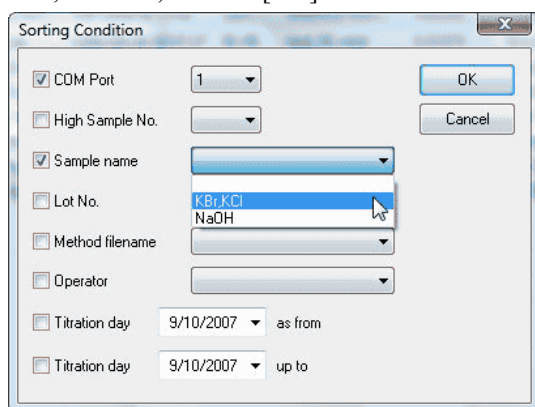


Click on [Refresh...] command from [View] menu.

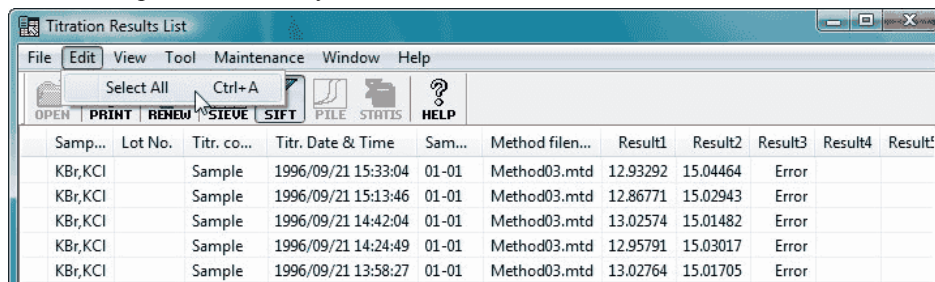
When the list of data appears, click on [Sorting Condition...] command from [Tool] menu or [SIEVE] button on tool bar.



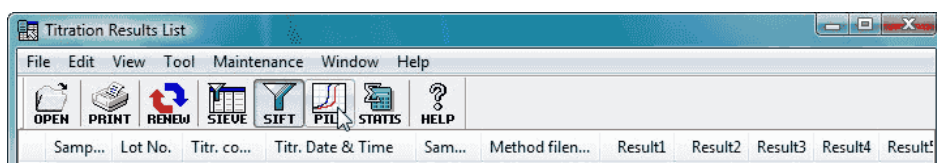
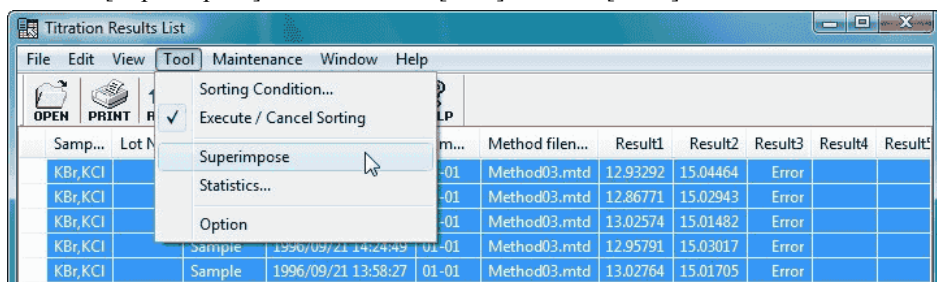
The dialog box [Sorting Condition] appears. Select the data to be superimposed. Check conditions for selecting data, and then, click on [OK] button.



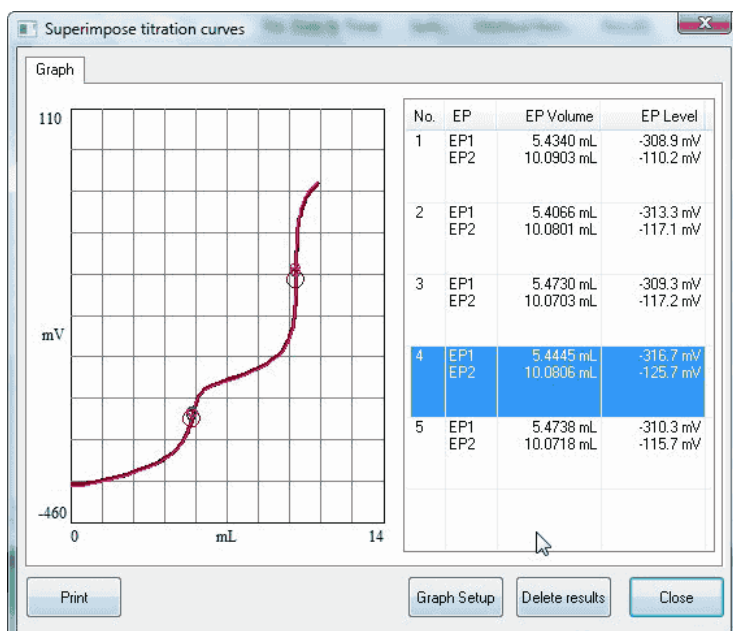
The data corresponding to the same conditions are shown on display. Click on [Select All] command from [Edit] menu to keep them in standby mode.



Click on [Superimpose] command from [Tool] menu or [PILE] button.



The display shows the dialog box [Superimpose titration curves]. When the data on the right is clicked on, its titration curve will be drawn in bold line.



Note:

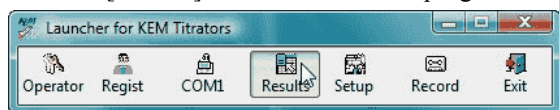
For details of superimpose titration curves dialog box, refer to 3-4-4-3. [Superimpose].

Note:

Measurement data of AT-700 cannot be superimposed on those of AT-510, AT-500N or AT-420N

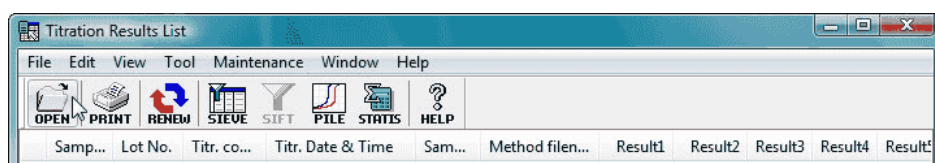
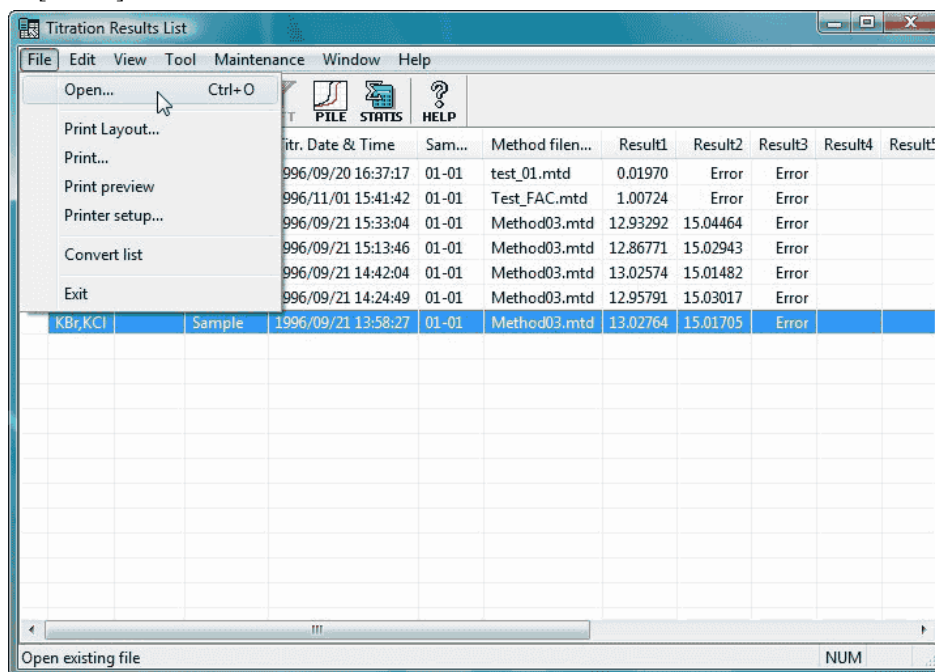
3-1-4-5. Document the data in Word

Click on [Results] button on Launcher program. The results list program starts.

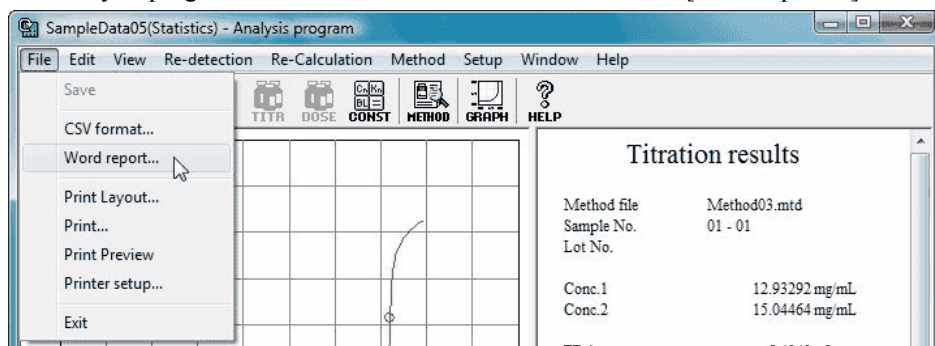


Click on [Refresh...] command from [View] menu.

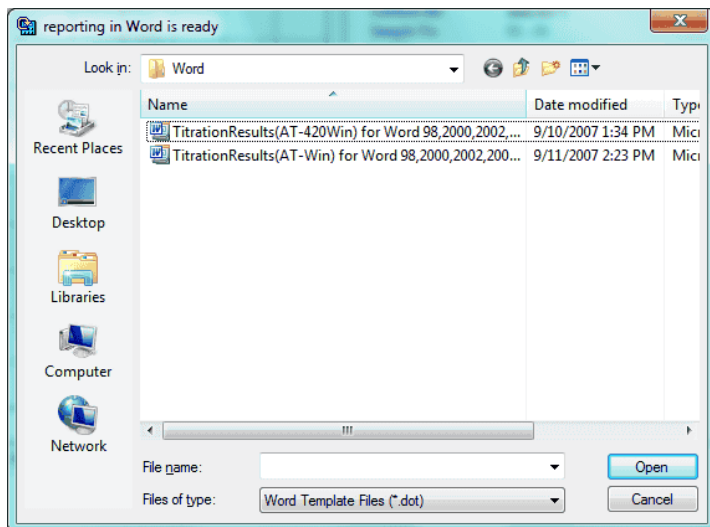
When the list of data is shown, select the data to document in Word. Click on [Open...] command from [File] menu or [OPEN] button on tool bar.



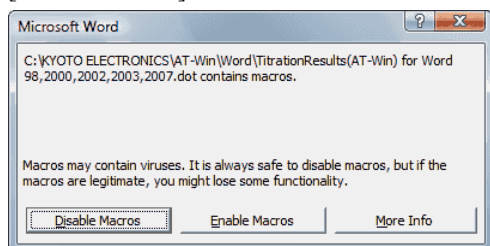
The analysis program for the selected data will start. Click on [Word report...] command from [File] menu.



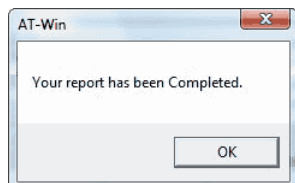
When the dialog box [reporting in Word is ready] appears, select a template file and click on [Open] button.



Microsoft word activates and starts documenting a report automatically. If the below message appears, choose [Enable Macros].



After the report making is finished, the below dialog box will appear. Click on [OK] button.



Note:

Do not press ESC Key while the report is being made. If you do, Macro stops. To use this function, either Microsoft Word 97/ 98/ 2000/ 2002/ 2003/ 2007/ 2010 has to be installed in advance.

< Microsoft Word 97/ 98/ 2000/ 2002/ 2003 >

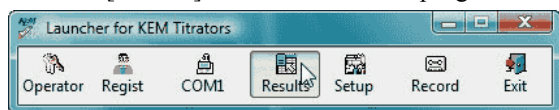
When the security level of the Microsoft Word is 'high', macros cannot be run. In this event, please lower the security level to medium or low in the security level setup. In the Microsoft Word 2000, the setting can be made in selecting [Tools]–[Macro]–[Security].

< Microsoft Word 2007/ 2010 >

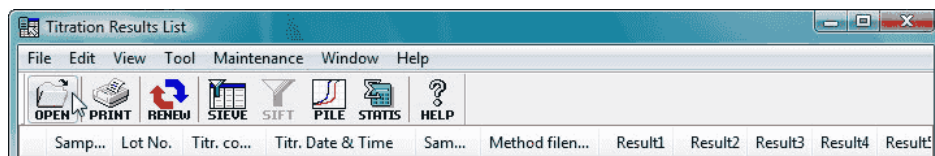
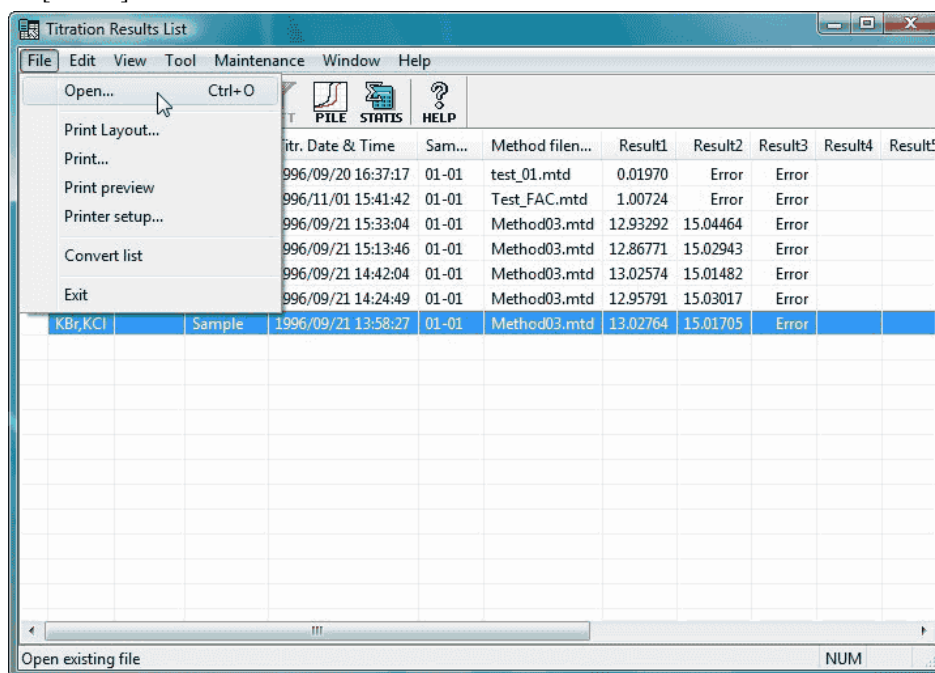
Macros cannot be run. In this event, please select [Enable all macros]. Setting can be made by selecting [Office Button]–[Word Options]–[Trust Center]–[Trust Center settings...]–[Macro settings].

3-1-4-6. Store the data in CSV format

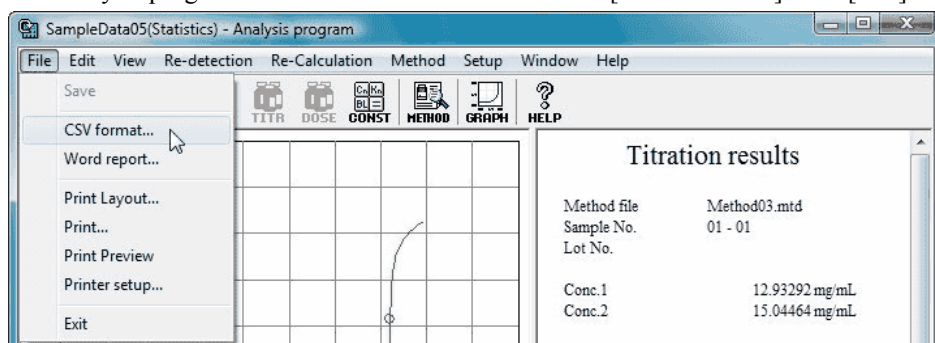
Click on [Results] button of Launcher program. The results list program starts.



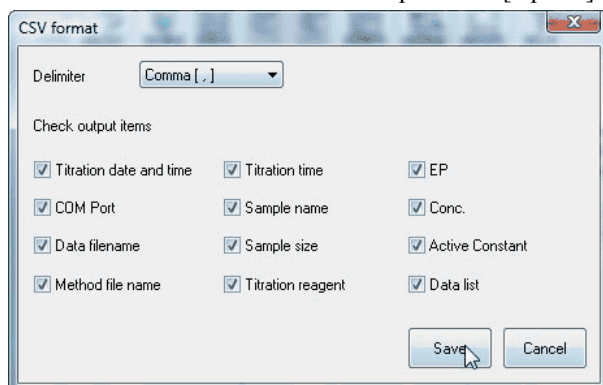
Select the titration data to store in CSV format from the list. Click on [Open...] command from [File] menu or click on [OPEN] button on tool bar.



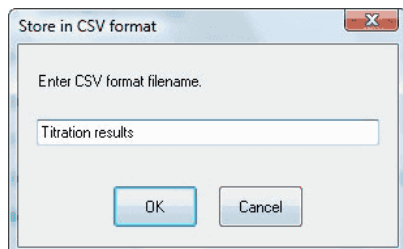
The analysis program for selected data starts. Click on [CSV format...] from [File] menu.



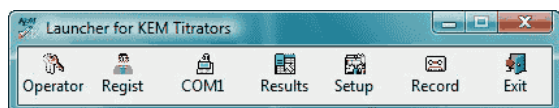
Check the items in [CSV format] to be stored, and click on [Save] button. The data will be stored under the same name as titration data in CSV folder preset on [Option] from [Setup] menu.



[Store in CSV format] dialog box appears. Enter the filename and click on [OK] button. The data will be saved in CSV folder preset in [Option] from [Setup] menu.



3-2. About Launcher program



The Launcher program controls all the AT-Win programs. There are 7 command buttons. Each function is described in below:



[Operator] button

This button changes the operator in charge.
When security is activated, user identification is required.



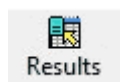
[Regist] button

Operators are registered with this button. Security function is set up here.



[COM...] button

The titration program selected and allocated at the COM port is executed.
Use [Setup] button to allocate COM port.



[Results] button

The results list program is activated with this button. Here, you can re-calculate the data or re-detect EP or transfer the list.



[Setup] button

This button configures communication parameters for RS output program as well as allocate COM port for titration program and RS output program.



[Record] button

The AT-Win operational record is shown with this button.



[Exit] button

The AT-Win program is finished with this button. All other programs including titration program, results list program and analysis program, etc. are also closed here.

[System] menu

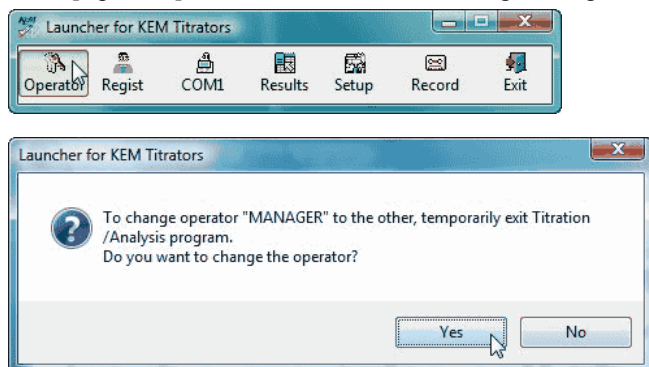
To show the system menu, point the cursor on title bar and click the right button of the mouse. A plural number of windows under AT-Win program can be switched to e.g., overlap the windows, show the windows in parallel, Minimize the screen, etc.

3-2-1. [Operator] button

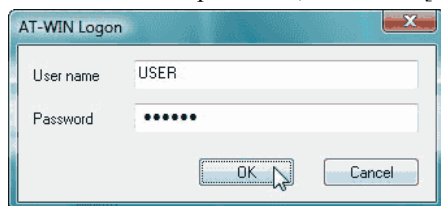
This button changes the operator in charge. While security mode is activated, it works for user identification.

To change an operator or check user identification, all the operators have to be registered by [Regist] button in Launcher program in advance. The default setting in plant before shipment, it is set to Auto logon mode with user ID "MANAGER" without a password.

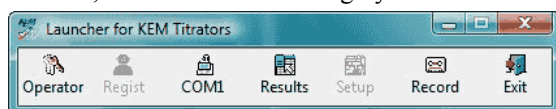
Press [Operator] button to show the confirming message as below, and click on [Yes].



[AT-Win Logon] dialog box appears. Enter user's name and password, and click on [OK] button. For registration of user name and password, see 3-2-2. [Regist] button.

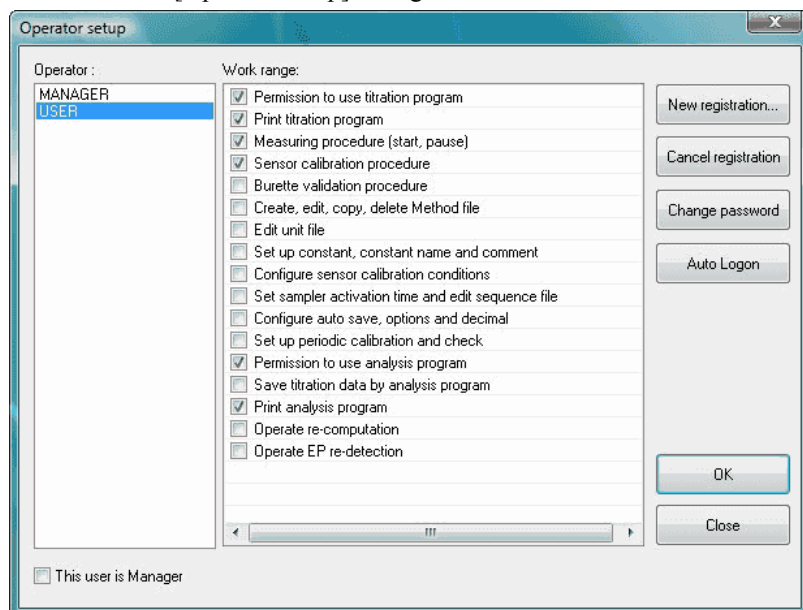


The Launcher program will appear again according to the registered contents by [Regist] button. Where no entry is allowed, such area is shown in gray.



3-2-2. [Regist] button

The operators are registered here. User name, password and job range are defined. Click on [Regist] button to show [Operator setup] dialog box.



[Operator]

The user names already registered are shown here.

[Work range]

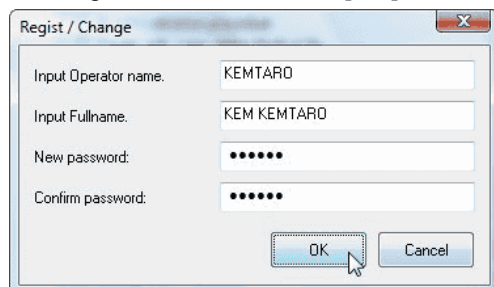
The range of user's job range is shown.

By selecting a user name, his job range will be shown. Check job items allowed for the person.

* If [This user is Manager] is checked, all kinds of job as well as Launcher program [Regist] and [Setup] buttons can be used by the person.

[New registration] button

New users are registered here. Click this button to show [Regist / Change] dialog box, and enter user name and his password, and click on [OK] button.



Note:

The range of entry is 1-50 small characters (large: 25) for user name, and 6-20 characters for password.

[Cancel registration]

A user name is erased and deleted here. Select a user name or names, and click on this button.

[Change Password] button

A password can be changed here. Select a user name on user list and click on this button. [Register / Change] dialog box appears. Enter the password and click on [OK] button.

[Auto Logon] button

Automatic logon mode can be set here. This mode is used when user identification by user name and password is not necessary. For Auto Logon, see 3-2-2-1. Auto Logon.

[OK] button

Registration of users is confirmed here, and its dialog box is closed.

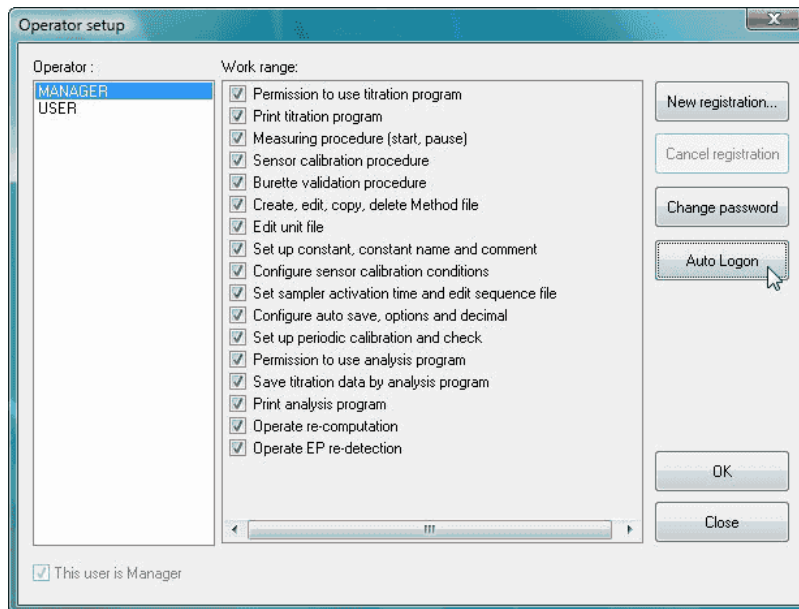
[Cancel] button

Registration of users is canceled here, and its dialog box is closed.

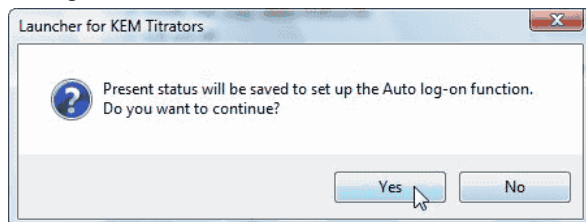
3-2-2-1. About Auto Logon

The Auto Logon provides auto-logon automatically without showing [AT-Win Logon] dialog box at start of AT-Win program. The operator can be changed after it is logged on.

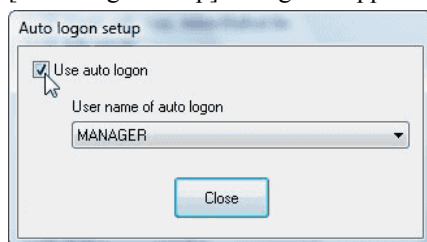
Click on [Regist] button of Launcher program. [Operator setup] dialog box appears, and select user name on the list for logon. Click on [Auto Logon] button.



When this button is clicked on, the confirming message appears, and click on [Yes]. If [No] is clicked on, the setting will be canceled.



[Auto Logon setup] dialog box appears. Check "Use Auto Logon".



[Change] button

The user name to use auto logon is changed here. Click this button to show [AT-Win Logon] dialog box. Enter user name and password to change them.

[Close]

[Auto Logon setup] dialog box is closed with this button.

3-2-3. [COMn] button

The program allocated for selected COM port is shown here. To allocate COM port, use [Setup] button.



..... The titration program of COM port where AT-700 is connected will start.



..... The titration program of COM port where AT-510 is connected will start.



..... The titration program of COM port where AT-500 is connected will start.



..... The titration program of COM port where AT-420 is connected will start.



..... This appears when a COM port for external output is provided.



..... This appears when a balance is connected.

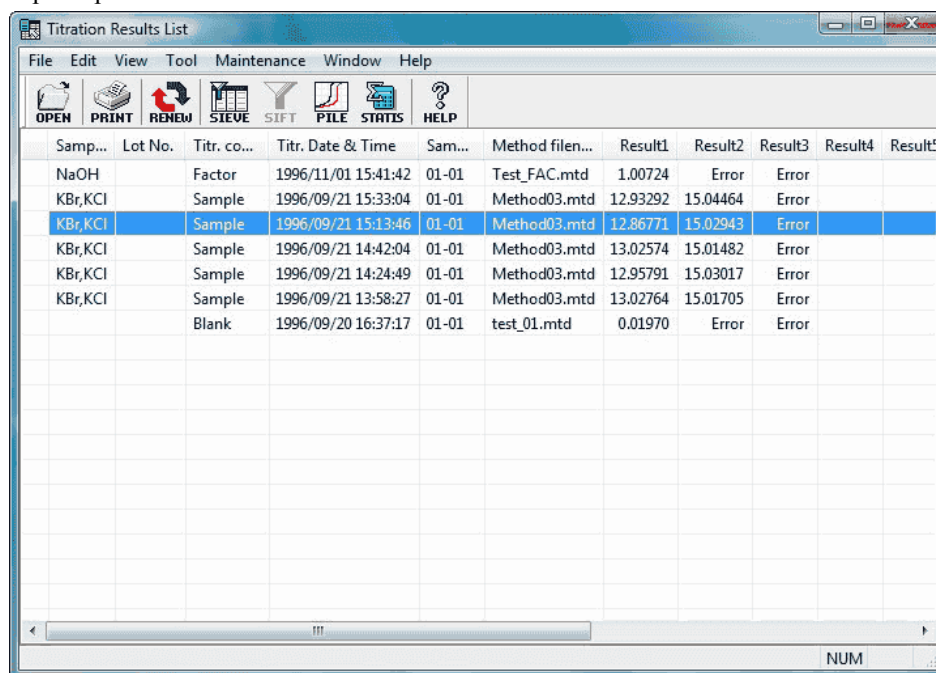
When [COM.....] button where a titrator is connected is clicked on, its titration program starts.

Note:

For setting COM port, see 3-2-5. [Setup] button. The COM port number changes depending on how it is connected.

3-2-4. [Results] button

The results list program starts. Here you can re-calculate the data, redetect endpoint, batch calculate the data or superimpose titration curves.



The screenshot shows a software window titled "Titration Results List". It has a menu bar with "File", "Edit", "View", "Tool", "Maintenance", "Window", and "Help". Below the menu bar is a toolbar with icons for "OPEN", "PRINT", "RENEW", "SIEVE", "SIFT", "PILE", "STATS", and "HELP". The main area contains a table with the following data:

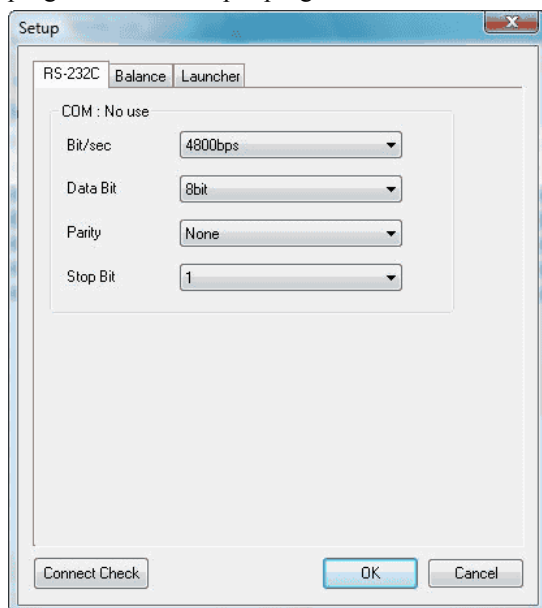
Samp...	Lot No.	Titr. co...	Titr. Date & Time	Sam...	Method file...	Result1	Result2	Result3	Result4	Result5
NaOH		Factor	1996/11/01 15:41:42	01-01	Test_FAC.mtd	1.00724	Error	Error		
KBr,KCl		Sample	1996/09/21 15:33:04	01-01	Method03.mtd	12.93292	15.04464	Error		
KBr,KCl		Sample	1996/09/21 15:13:46	01-01	Method03.mtd	12.86771	15.02943	Error		
KBr,KCl		Sample	1996/09/21 14:42:04	01-01	Method03.mtd	13.02574	15.01482	Error		
KBr,KCl		Sample	1996/09/21 14:24:49	01-01	Method03.mtd	12.95791	15.03017	Error		
KBr,KCl		Sample	1996/09/21 13:58:27	01-01	Method03.mtd	13.02764	15.01705	Error		
		Blank	1996/09/20 16:37:17	01-01	test_01.mtd	0.01970	Error	Error		

Note:

For results list program, see 3-4. Results list program.

3-2-5. [Setup] button

This button configures communication parameters for RS output program, allocation of COM port for titration program and RS output program. When this button is pressed, [Setup] dialog box appears.



[RS-232C]

Here digital configuration for communication via COM port for external output is made. Setting communication protocol is made after COM port is automatically checked with [Connect Check] button.

[Balance]

The electronic balance is set up here. Setting a balance is made after COM port is automatically checked with [Connect Check] button.

Note:

For setting up a balance, see 4-1-1. Electronic Balance.

[Launcher]

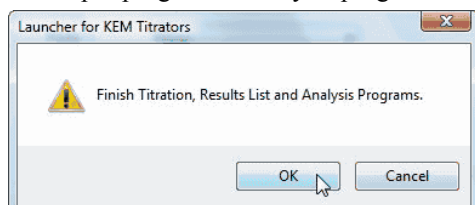
The Launcher program display is made here. When “Show Launcher in front” is selected, the Launcher program appears in front of screen all the time.

[Connect Check] button

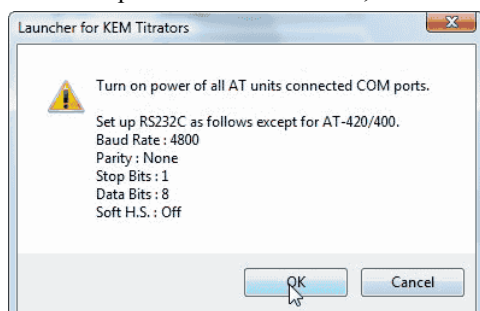
The COM port is automatically checked here. Priority is given to those COM ports which are connected to a titrator or balance. Other COM ports can be used for external output.

< How to confirm connection >

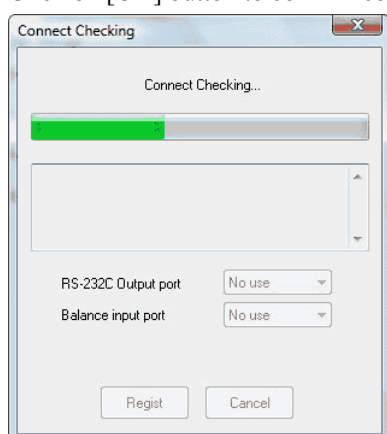
Click on [Connect Check] button. The confirming dialog box appears. It closes when the titration program, RS output program or analysis program is shown active on display.



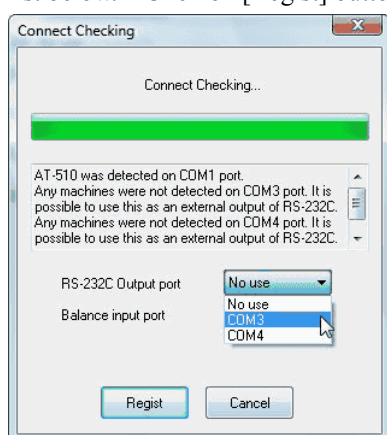
When the power for titrator is off, turn it on. Configure communication protocol according to the messages.



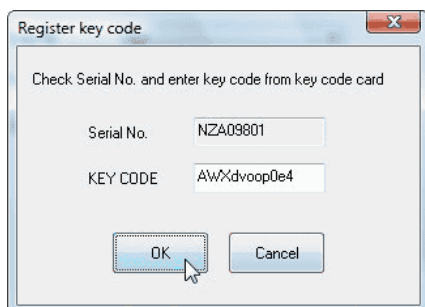
Click on [OK] button to confirm connections.



Available COM ports are checked here. For use of RS output program or Balance, allocate COM port from the list below. Click on [Register] button to allocate each COM port.

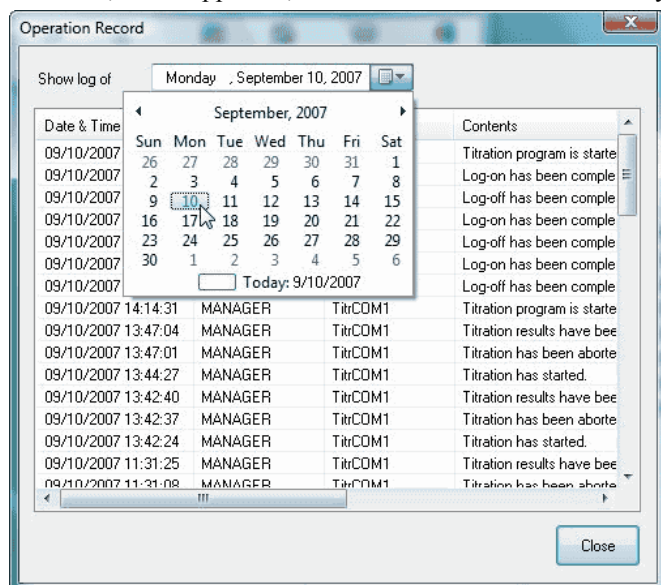


When a titrator device is detected, [Register key code] dialog box appears. Enter the key code shown on the supplied key code card, and click on [OK] button. [Register Key Code] dialog box will show the number of detected titrators.



3-2-6. [Record] button

The record of operations by AT-Win is shown here. The history includes logon/logoff, re-calculations, changed constants, errors appeared, etc. This record is renewed everyday.



Note:

Operational records will be updated by rebooting the Launcher program.

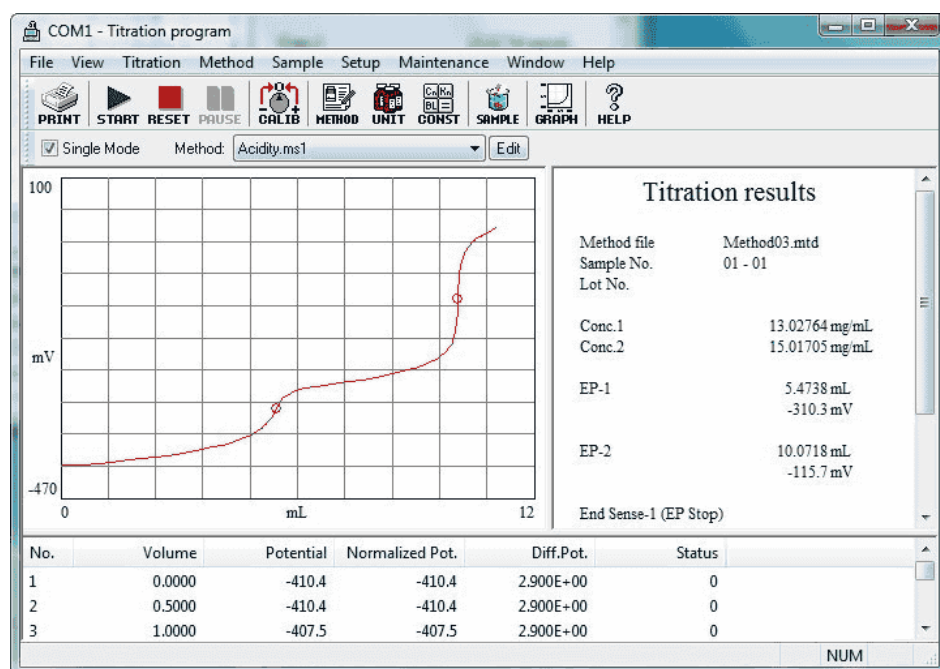
3-2-7. [Exit] button

All AT-Win programs are closed with this button.

3-2-8. [System] menu

The windows (cascade, arrange all, minimize all) managed by AT-Win program can be switched by this button. Point the cursor on title bar of Launcher program, and click the right button of the mouse to show the menu.

3-3. Titration program



[File] menu

- Auto Save : Select filenames and CSV format
- Print Layout : Select printed items and format
- Print : Print titration data
- Printer Setup : Select a printer or connections
- COM Port Output : Select real time output from COM port
- Exit : Finish the titration program

[View] menu

- Toolbar : Select to display toolbar and change icon size
- Close Titration Curve : Closes the titration curve
- Close Information : Closes the information window
- Close Data List : Closes the data list
- View : All Views titration curve, information on titration and data list
- Statusbar : Select to view the status bar
- Group 1,2,3,4,5 : Change over the combined titration results

[Titration] menu

- Start : Starts titration
- Pause : Pause /cancel titration
- Reset : Abort the titration
- Calibrate Sensor : Calibrate sensor of electrode
- Burette Validation : Validate precision of burette capacity
- Change Max. Volume : Changes the maximum volume of titration

[Method] menu

Edit	: Edit the existing Method
Navigation	: Create Method by navigation mode
Create	: Create new Method
Copy	: Create Method based on existing Method
Delete	: Delete Method
Unit File	: Provides information on titration solution
Constant	: List of constants used in currently active Method
All Constant	: The list of all constants used in AT-Win

[Sample] menu

Setup	: Sets up sample parameters
Single Mode	: Change over sample setup to single mode
Sample File Mode	: Change sample setup to multiple sample mode
Changer Mode	: Change sample setup to Changer mode

[Setup] menu

Titration Curve	: Sets up titration curve on display
Number of Digits after Decimal	: Select a number of digits after decimal point for various constants
Constant Name, Comment	: Constant for sample or titration solution
Sensor Calibration Condition	: Set up conditions for calibrating electrodes or sensors
pH Table File	: Set up auto calibration table for pH electrode
Sample Changer	: Set up sequence for auto sampler
Option	: Set up filing folders

[Maintenance] menu

Periodic Calibration / Check	: Set up date for periodic calibration or check
Calibration / Check / Validation Record	: View records of periodic calibration /check /burette validation
Operation Record	: View records of alarms, errors and logs
Alarm	: Check alarms

[Window] menu

Cascade	: Superimposes windows
Arrange All	: Shows windows in parallel
Minimize All	: Zoom out all windows
Restore All	: Enlarge minimized windows to original size

[Help] menu

Manual	: Shows operation manual
System Information	: Shows connected equipment
About	: Information on software version of titration program

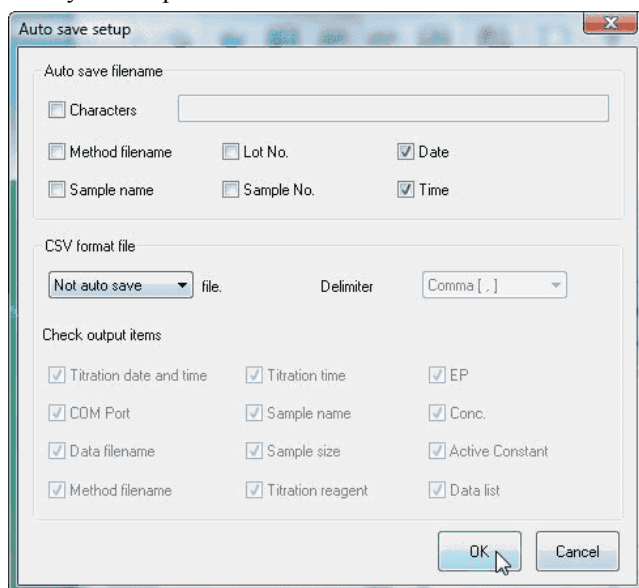
Note:

The changer mode is not shown on the titration programme where AT-510, AT-500N or AT-420N is connected.

3-3-1. [File] menu

3-3-1-1. [Auto Save] command

Here you set up auto save titration results. Click this command to open [Auto save setup] dialog box.



[Auto save filename]

The items are added to automatically saved filename in the following priority order. When an item is checked, the item is added to the filename.

1. Characters
2. Method filename
3. Sample name
4. Lot No.
5. Sample No.

Note:

Date and time are automatically added to filenames. Those invalid characters for filename like (¥, /, , , :, *, ? <, >) are automatically converted to '_' and saved.

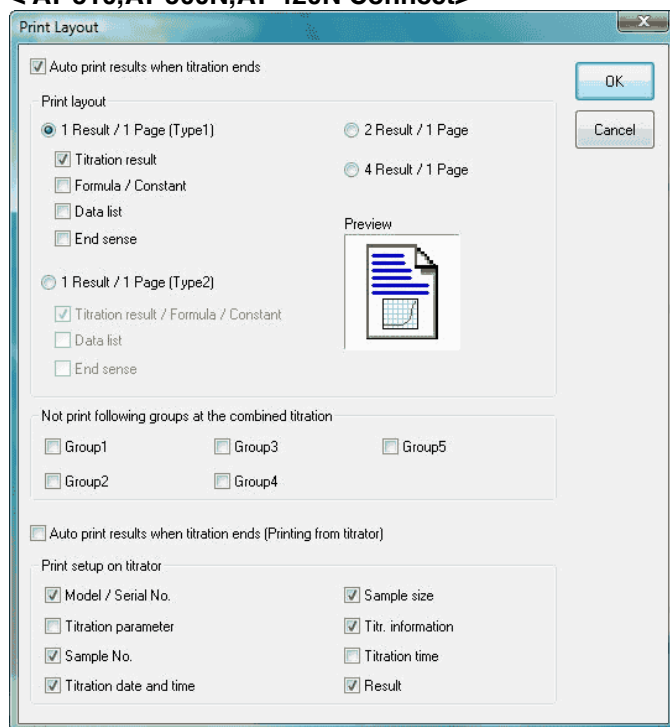
[CSV format file]

- File
Select auto save or not.
- Delimiter
Define data delimiter in CSV format.
- Check output items
When desired data are selected, any of the following boxes when checked can be saved.

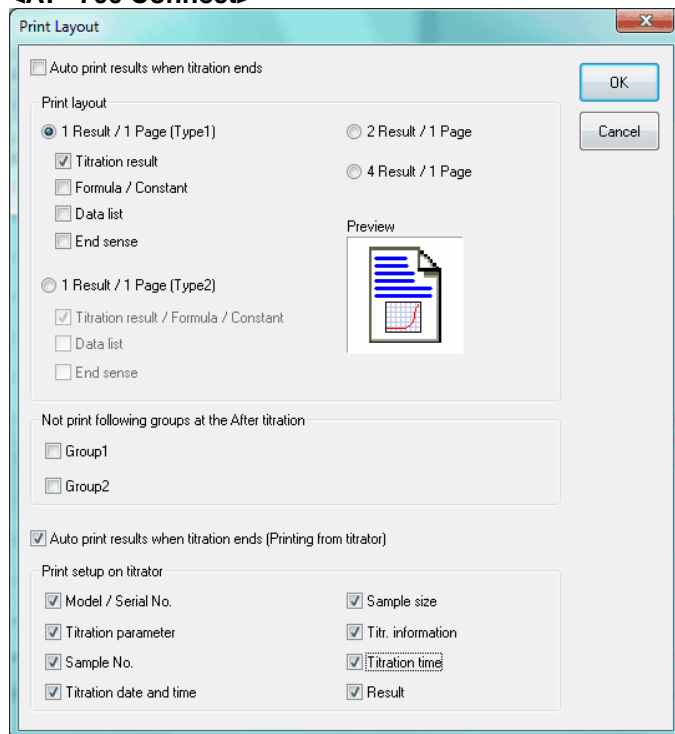
3-3-1-2. [Print Layout] command

Set up printed items and format. When this command is executed, [Print Layout] dialog box appears.

< AT-510,AT-500N,AT-420N Connect>



<AT-700 Connect>



[Auto print results when titration ends]

When this command is checked, the titration results are automatically printed out from the printer connected to PC.

< Print Layout >

[1 results / 1 sheet]

Prints out the results on a sheet.

- Titration results : When this item is checked, the results are included in the printout.
- Formula / Constant : When this item is checked, the formula and constant are included in the printout.
- Data list : When this item is checked, the data list is included in the printout.
- End Sense : When this item is checked, EP Sense Value is included in the printout.

[1 Result / 1 page (Type2)]

One resulting data is printed out on a sheet of paper.

Titration results / Formula / Constant : If this item is checked, the printed titration data include the results, calculation formula and constant list.

Data list : If this item is checked, the printed titration data include the data list.

EP sense level : If this item is checked, the printed titration data include EP sense level.

[2 results / 1 sheet]

2 results are printed on one sheet.

[4 results / 1 sheet]

4 results are printed on one sheet.

Note:

For details of Example of printed results, refer to References.

< Not print following groups at the combined titration >

[Groups 1, 2, 3, 4, 5]

When this box is checked, the groups checked are not printed out at the combined titration.

Note:

“Not print following groups at the combined titration” is not shown on the titration programme where AT-700 is connected.

< Not print following groups at the after titration >

[Groups 1, 2,]

When this box is checked, the groups checked are not printed out at the after titration.

Note:

“Not print following groups at the after titration” is not shown on the titration programme where AT-510, AT-500N or AT-420N is connected.

[Auto Print Results When Titration ends]

When this command is checked, the titration results are automatically printed out from the printer connected to titrator.

< Titrator print setup >

[Model name, Serial number]

When this box is checked, the model name and serial number are printed out.

[Titration parameter]

When this box is checked, the Titration parameters are printed out.

[Sample No.]

When this box is checked, the sample number is printed out.

[Titration date and time]

When this box is checked, the titration date and time are printed out.

[Sample Size]

When this box is checked, the sample size is printed out.

[Information]

When this box is checked, the information on titration is printed out including the initial potential and temperature, final titration volume and potential, fixed dose volume.

[Titration time]

When this box is checked, the titration time is printed out.


[Results]

When this box is checked, the titration results are printed out.

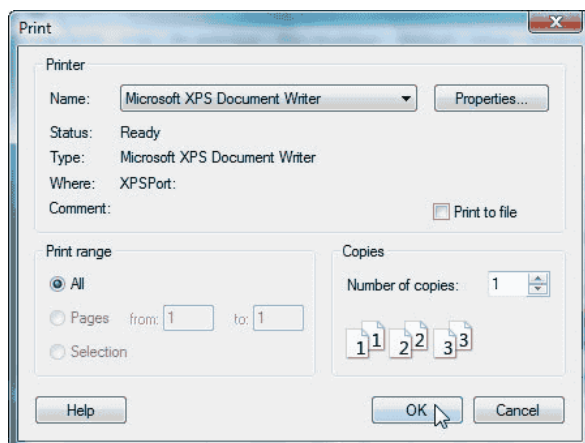
3-3-1-3. [Print] command

It prints out titration results. The dialog box prompts for options like pages, the number of sheets and the printer. The following options can be selected regarding titration data and parameters.

Short cut

Toolbar : 

Keyboard : [CTRL] + [P]



[Printer]

Preset printer and port are shown here. To change them, select from [Name] box.

[Print Range]

Select the pages you want to print out.

All : Prints all pages

Pages : Enter the page you want to print

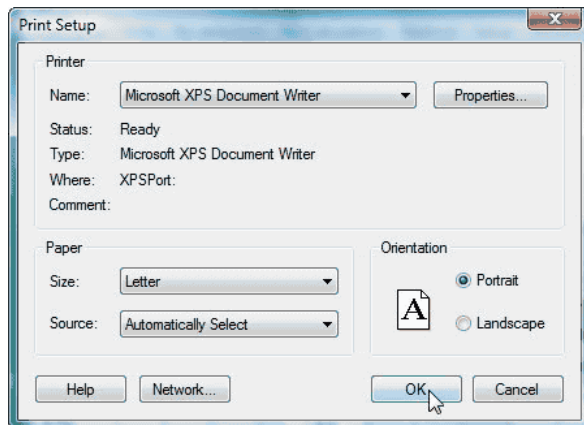
Selection : Not available

Note:

[Print] dialog box may differ according to your Windows or printer.

3-3-1-4. [Printer Setup] command

Here you set up printer selection and connections.



[Printer Name]

When more than one printer is connected, you can select a printer you want to use from the dropdown list box.

If you want to add another printer or use different port, use Control Panel of Windows referring to its manual.

[Orientation]

Set print direction to Portrait.

[Paper Size]

Select A4 or Letter size.

[Paper Source]

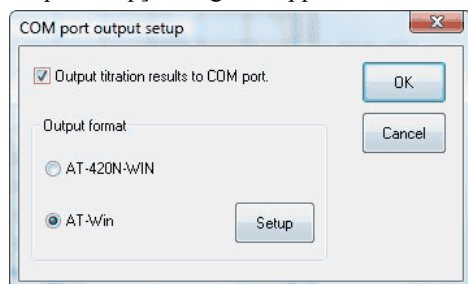
For printing with a plural number of paper trays, select a tray you want to use.

Note:

[Printer Setup] dialog box may differ according to your Windows or printer.

3-3-1-5. [COM Port Output] command

The results can be output from COM port when titration is over. When this command is clicked on, [COM Port output setup] dialog box appears.



[Output titration results to COM port]

When this is selected, the results are output from COM port according to the preset output format when the titration is over.

< Output format >

[AT-420N-WIN]

The output data format is the same as AT-420N-WIN.

[AT-Win]

Data is output in the format selected in [Output Setup] dialog box.

[Setup]

[Output Setup] dialog box appears.

[Output Setup] dialog box

Output Setup

Heading Code: Delimiter: OK

Ending Code: Cancel

Output item setup

Non-output Items

Item	Byte
EP3 Volume	9
EP3 Level	9
EP3 Corr. volume	9
EP4 Volume	9
EP4 Level	9
EP4 Corr. volume	9
EP5 Volume	9
EP5 Level	9
EP5 Corr. volume	9
Conc. 3	9
Conc. 4	9
Conc. 5	9

Output Items Total: 253 Byte

Item	Byte
COM Port No.	2
Date & Time	12
Operator	40
Method Filename	40
High Sample No.	2
Low Sample No.	2
Sample Name	40
Titration Volume	9
EP1 Volume	9
EP1 Level	9
EP1 Corr. volume	9
EP2 Volume	9
EP2 Level	9
EP2 Corr. volume	9
Conc. 1	9
Conc. 2	9

Space: Byte

Note:

[Heading Code] : Select the heading code for data output.

[Ending Code] : Select the ending code for data output.

[Delimiter] : Select a mark-off symbol at the end of data output.

[Non-output Items] : The items in this list are not output.

[Output Items] : The items in this list are output.

[Space] : Space can be added to the output items. Up to 64 bytes spaces can be inserted.

The output data are formatted as follows:

Heading Code

The first output item + Delimiter

The second output item + Delimiter

:

:

:

Ending Code

The format for the above example on display is as follows:

STX

COM Port No. + CRLF

Date & Time + CRLF

:

:

:

EOT

3-3-1-6. [Exit] command

This command closes the titration program.

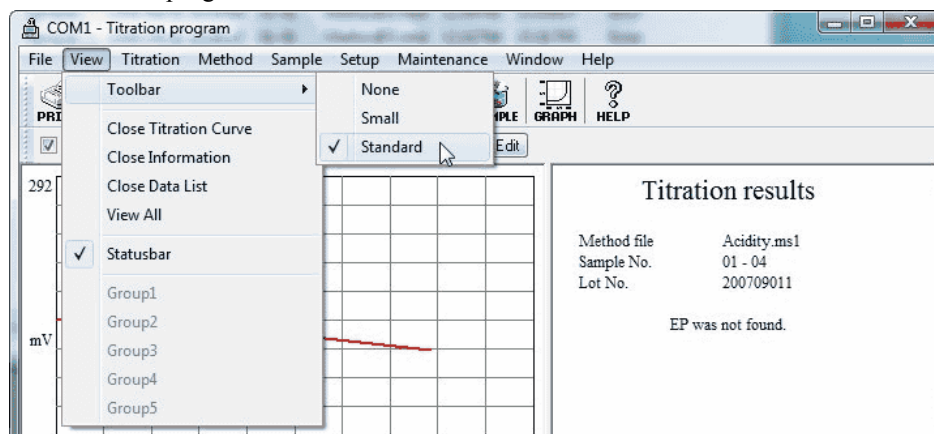
Short cut

Keyboard : [ALT] + [F4]












3-3-2. [View] menu

3-3-2-1. [Toolbar] command

Select to display toolbar or not. Toolbar includes the same tools as the most frequently used command like [Start] in the titration program.



<Tool button>

Button	Description
	Prints currently displayed titration data just like [Print] command in [File] menu.
	Starts titration just like [Start] command in [Titration] menu.
	Resets condition just like [Reset] command in [Titration] menu.
	Pauses or cancel pause titration just like [Pause] command in [Titration] menu.
	Calibrates the sensor just like [Calibrate Sensor] command in [Titration] menu.
	Edit Method file just like [Edit] command in [Method] menu.
	Edit Unit file just like [Unit File] command in [Method] menu.
	Shows the active constants list just like [Constant] command in [Method] menu.
	Configures sample parameters just like [Setup] command in [Sample] menu.
	Set up titration curve just like [Titration Curve] command in [Setup] menu.
	Shows operation manual works just like [Manual] command in [Help] menu.

3-3-2-2. [Close titration curve] command

This command closes titration curves.

3-3-2-3. [Close Information] command

It closes the information window, which informs of current titration volume, potential, temperature, etc.

3-3-2-4. [Close Data List] command

It closes the data list window, which shows titration volume, potential, differential value, etc.

3-3-2-5. [View All] command

It shows titration curves, information window and the data list.

3-3-2-6. [Statusbar] command

Select to view the status bar.

When the menu command is selected, simple description appears to the left of status bar. Likewise, the description appears with toolbar pressed. If you want to cancel the command, remove the mouse pointer away from the toolbar button.

Whether the following keys are ON or OFF are shown to the right of status bar.

Key	Description
CAP	[Caps Lock] key is ON
NUM	[Num Lock] key is ON
SCRL	[Scroll Lock] key is ON
COM1	Shows currently used COM port number.

When the status bar is displayed, the check mark appears alongside command name.

3-3-2-7. [Group 1,2,3,4,5] command

It shows the titration data of selected group. This command shows the group of combined titration or after titration. The display shows the group of ongoing titration, and you cannot change the display while titration is underway. A check mark appears alongside command name for the group on display.

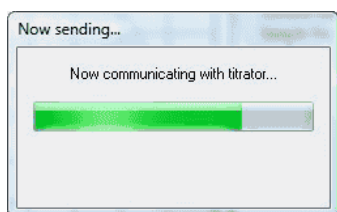
3-3-3. [Titration] menu

3-3-3-1. [Start] command

This command starts titration. When this command is clicked on, [Now Sending...] dialog box appears, and measurement parameters are transferred to the titrator.

Short cut

Toolbar



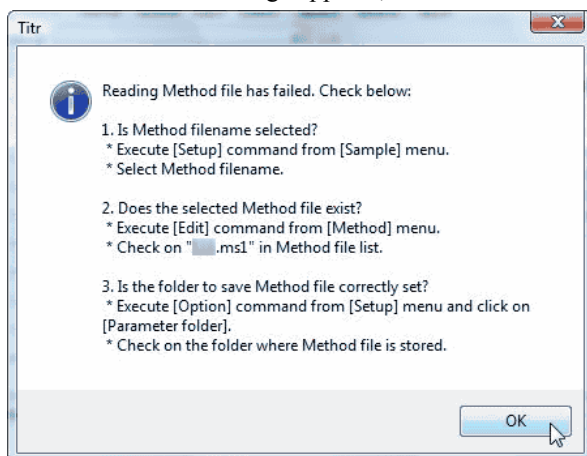
Cautions during titration

Note the following cautions while titration is underway

- Do not turn off power of the titrator.
- Do not remove the cable between PC and titrator.
- Do not disconnect the cable.

Error at titration start-up

If the below error message appears, titration will not start.



The possible causes for the error are shown below. Check your settings you made if they are correct first.

- A burette number which is not connected is entered in Titration/ Fixed dose parameter for Method file.
- The Method file preset by [Setup] command from [Sample] menu does not exist in the path for the Method file defined by [Folder] within [Option] command from [Setup] menu.
- The Method file defined by [Setup] command from [Sample] menu does not work with the connected titrator.

About the titration with a multiple sample changer

Pay attention to the following notes when you use an auto sampler for continuous titration.

- Select [Sample File Mode] from [Sample] menu.
- Configure settings for the sampler on Sample File Setup.

3-3-3-2. [Pause] command

It pauses or cancel pause titration.

This command can stop the ongoing titration or resume titration when this command is executed again.

Short cut

Toolbar

:



Note:

Pause cannot be used on the titration programme where AT-700 is connected.

3-3-3-3. [Reset] command

This command turns the titrator and sampler to reset condition.

When this command is executed during titration, it aborts titration.

Short cut

Toolbar

:

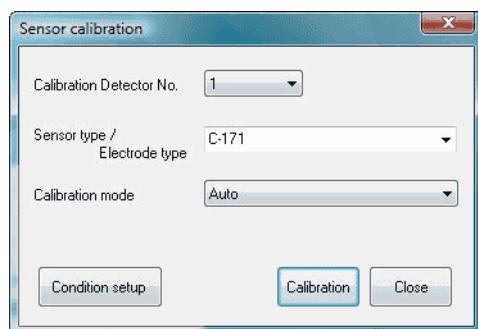


3-3-3-4. [Calibrate Sensor] command

Here the electrode or sensor connected to titrator (AT-510, AT-500N) is calibrated. When this command is executed, [Calibrate Sensor] dialog box appears.

Short cut

Toolbar



Note:

This command works under the conditions present on [Sensor Calibration Condition] from [Setup] menu.

The calibrated results are automatically saved in [Calibration / Check / Validation Record] in [Maintenance] menu.

[Calibration Detector]

Select the detector number for sensor calibration.

[Sensor type / Electrode type]

Select sensor name or electrode type. If not listed, enter the name.

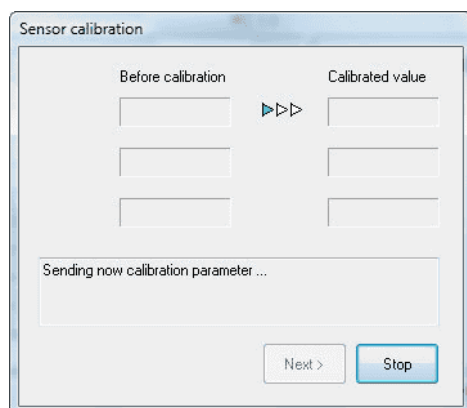
[Calibration mode]

Select a mode for sensor calibration.

Calibration mode depends on the detector type and number Connected to the titrator.

[Calibration] button

When this button is clicked on, the dialog box [Sensor calibration] opens. Follow the guiding messages for sensor calibration. Configure conditions for calibration according to [Sensor Calibration Condition] submenu.



[Condition Setup] button

This button when clicked on opens the dialog box [Sensor Calibration] for each detector from [Sensor Calibration Condition] menu.

Sensor calibration [pH (ch1)]

Auto calibration parameter

Calibration liquid temperature: 25 °C

Temperature compensation table: JIS

pH table: [dropdown]

Calibration point: pH7/4

Stability sense level: 3 mV/sec

Manual calibration parameter

Number of calibration point: 2

First calibration point pH value: 6.88

Second calibration point pH value: 4.01

Third calibration point pH value: 9.18

OK Cancel

Note:

For details of the dialog box [Sensor Calibration], refer to [3-3-6-4. Sensor Calibration Condition] submenu.

About detector number and calibration mode

<AT-510,AT-500N,AT-420N>

Select an appropriate detector type (5 types of preamplifier) from below chart

Detector type		Detector No. and detection unit			Calibration mode	
Application	Type	ch1	ch2	ch3	ch1	ch3
Standard	STD-510	pH/mV	mV	—	Auto/Manu	—
Photometric	PTA-510	pH/mV	mV	%T/Abs	Auto/Manu	Manual
Polarization	POT-510	pH/mV	mV	μA/mV	Auto/Manu	Polar current/voltage
Conductivity	CMT-510	pH/mV	mV	μS	Auto/Manu	Cell constant/ Standard liquid
2-way pH	TET-510	pH/mV	mV	pH/mV	Auto/Manu	Auto/Manu

<AT-700>

Select an appropriate detector type (4 types of preamplifier) from below chart

Detector type		Detector No. and detection unit			Calibration mode	
Application	Type	ch1	ch2	ch3	ch1	ch3
Standard	STD	pH/mV	mV	—	Auto/Manu	—
Photometric	PTA	—	—	%T/Abs	—	Manual
Polarization	POT	—	—	μA/mV	—	Polar current/voltage
Conductivity	CMT	—	—	μS	—	Cell constant/ Standard liquid

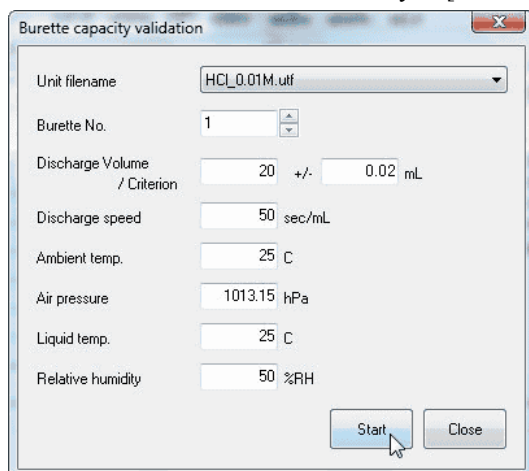
Cautions during calibration

Note the following cautions while calibration is underway

- Do not turn off power of the titrator.
- Do not remove the cable between PC and titrator.
- Do not disconnect the cable.

3-3-3-5. [Burette Validation] command

To validate the capacity of burette, open the dialog box [Burette Capacity Validation]. The results of this calibration are recorded automatically in [Calibration / Check / Validation Record] from [Maintenance] menu.



[Unit filename]

Select Unit file to validate burette capacity.

[Burette No.]

Select a number of power burette to be used in burette validation.

[Discharge Volume / Criterion]

Define the volume of dispensing and its range of criteria.

[Discharge speed]

Select dispensing speed of burette.

[Ambient temp.]

Select ambient temperature at time of validation.

[Air pressure]

Select barometric pressure at time of validation.

[Liquid temp.]

Select temperature of pure water in burette.

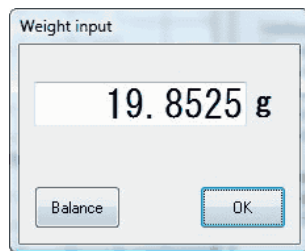
[Relative humidity]

Select relative humidity for validation.

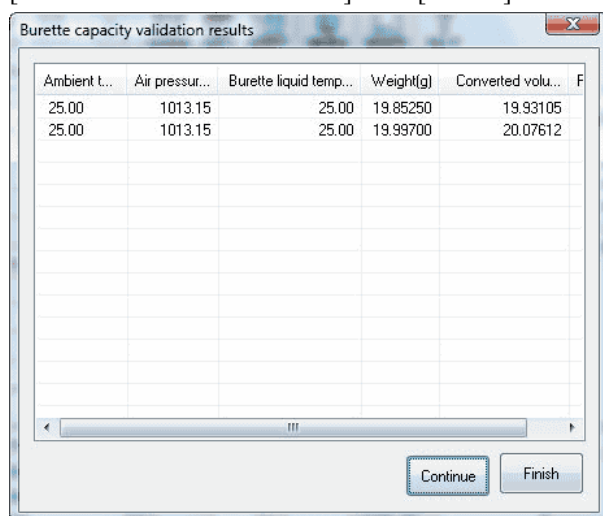
Note:

For validation of burette capacity precision, a thermometer and an electronic balance with precision $\pm 0.1^{\circ}\text{C}$ and $\pm 0.0002\text{g}$ respectively are necessary.

With [Start] button, the burette starts dispensing. When the discharge reaches preset amount for dispense, [Weight input] dialog box appears. Weigh the dispensed pure water, and enter its weight, and click on [OK] button. When a balance is connected, [Balance] button enables entry of weight.



[Burette capacity validation results] dialog box appears. Based on the dispensed weight calculated under the preset conditions at 20°C, the validation is judged within the criterion. The results are automatically saved in [Calibration/ Check/ Validation] from [Record] menu.



To continue validation, click on [Continue Validation] button.

< About capacity conversion >

The conversion of burette capacity from weight to volume is calculated according to JIS K0050 and JIS K0061 as follows:

$$V(\text{mL}) = W \times \{1 + \rho \times (1/dt - 1/d')\} / \{1 + a \times (\text{Temp} - 20)\} \times dt$$

W (g) : Discharged weight of water

ρ (g/cm³) : Calculated from below formula at barometrical pressure and relative humidity and air density at time of validation

dt (g/cm³) : Density of pure water at temperature at time of validation

d' (g/cm³) : Density of weight (=8.0g/cm³ fixed)

a (K⁻¹) : Expansion coefficient of burette glass (=97.5 × 10⁻⁷ fixed)

Temp (°C) : Temperature of pure water at time of validation

$$\rho(\text{g/cm}^3) = 0.001293 \times \{273.15 / (273.15 + t)\} \times \{(P - 0.0378 \times e) / P_0\}$$

t (°C) : Ambient temperature

P (kPa) : Barometrical pressure at time of validation (P=0.1 × hPa)

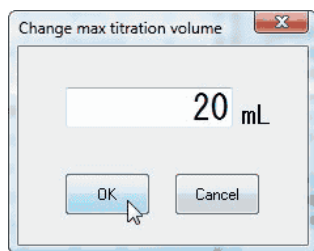
e (kPa) : Pressure of water vapor (e=0.01 × RH(%) × e0)

e0 comes from Saturated Water Vapor from Annex 2 of JIS K0061

P0 (kPa) : Reference barometrical pressure (=101.325kPa)

3-3-3-6. [Change Max. Volume] command

To change the maximum titration volume, open this dialog box [Change max titration volume], and enter the maximum volume and click on [OK] button. This command works only while titration is underway.



Note:

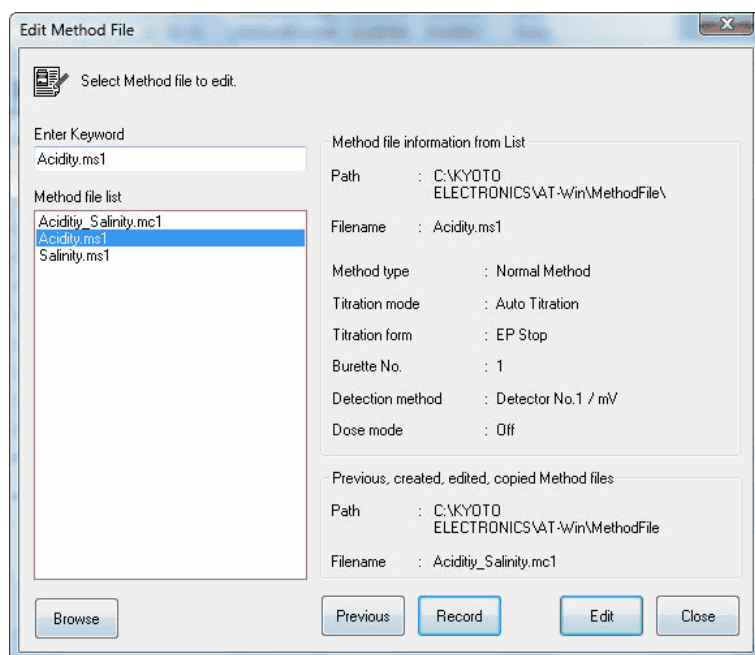
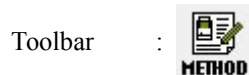
In the titration with a Combined Method, change in maximum titration volume will take effect on ONLY FIRST Method -- NOT on second through fifth Method.

3-3-4. [Method] menu

3-3-4-1. [Edit] command

To edit the existing Method, click on this command and open [Edit Method File] dialog box. Select the Method filename to edit from Method file list, and click on [Edit] button.

Short cut



[Browse] button

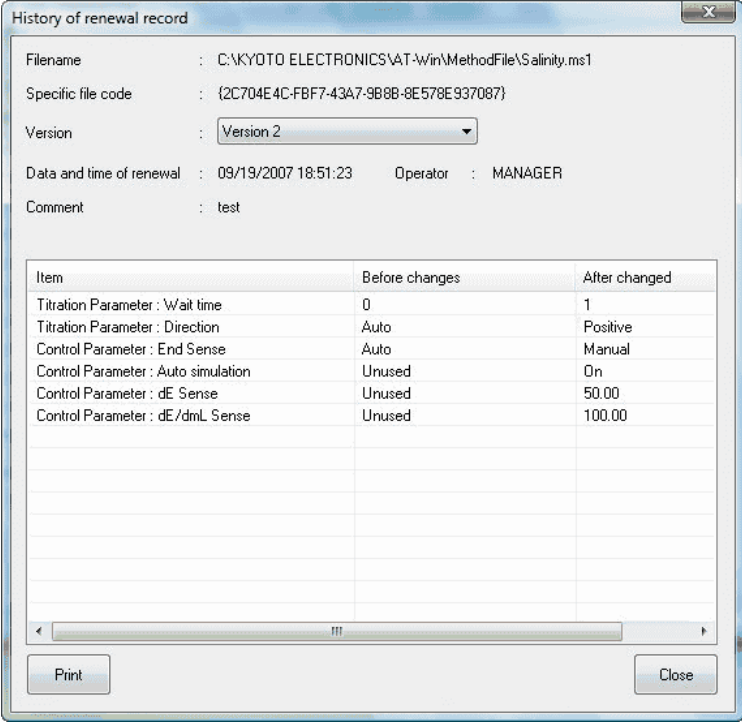
You can change a path (folder where Method file is stored). Click on this button to show [Browse for Folder] dialog box.

[Previous] button

This button shows previously edited files.

[Record]

The record of updated Method files are shown here.



History of renewal record

Filename : C:\KYOTO ELECTRONICS\AT-Win\MethodFile\Salinity.ms1
Specific file code : {2C704E4C-FBF7-43A7-9B8B-8E578E937087}
Version : Version 2
Data and time of renewal : 09/19/2007 18:51:23 Operator : MANAGER
Comment : test

Item	Before changes	After changed
Titration Parameter : Wait time	0	1
Titration Parameter : Direction	Auto	Positive
Control Parameter : End Sense	Auto	Manual
Control Parameter : Auto simulation	Unused	On
Control Parameter : dE Sense	Unused	50.00
Control Parameter : dE/dmL Sense	Unused	100.00

Print Close

[Edit] button

Shows selected Method files.

[Close] button

This button closes [Edit Method File] dialog box.

Note:

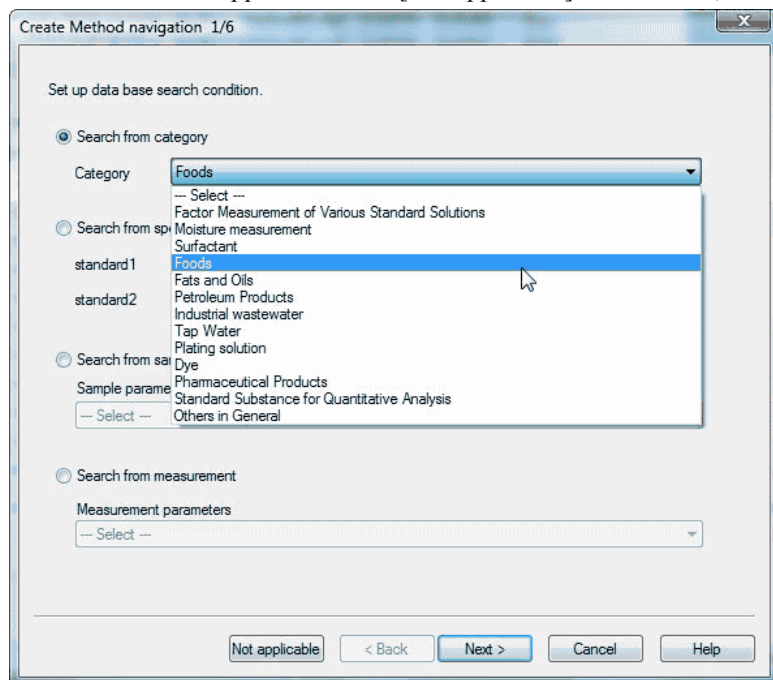
For Method file setup and edit, refer to 3-6. About Method File.

3-3-4-2. [Navigation] command

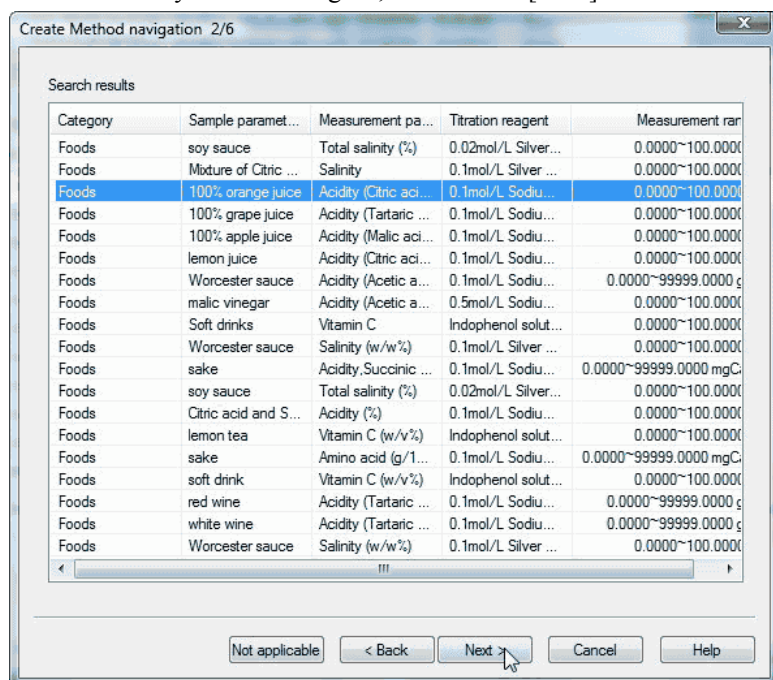
To create Method files by navigation mode, click on this command to open [Create Method navigation] dialog box. There are two ways to create by navigation: “Search Data Base” and “Wizard Setup”.

<Search Data Base>

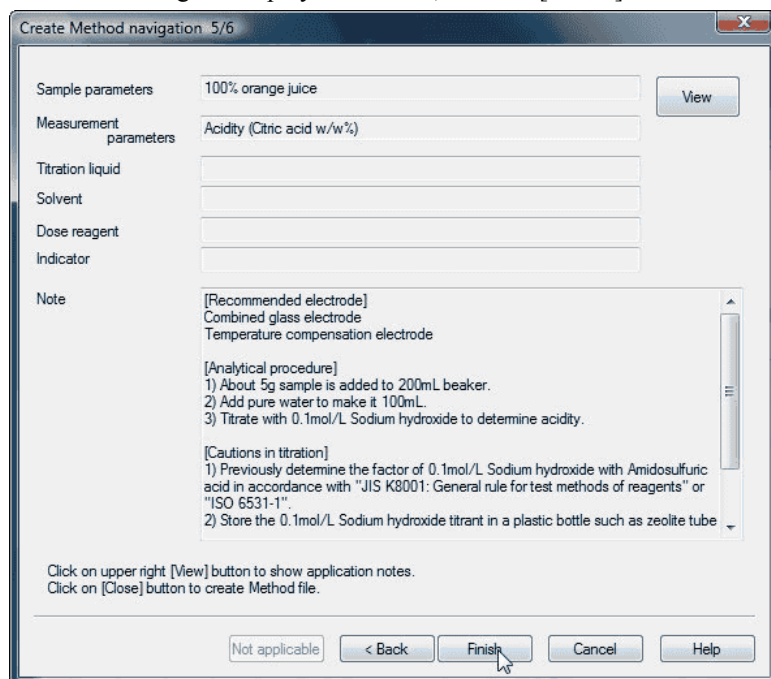
Select conditions by clicking on Data Base Search Condition. By clicking on [Next] button, the list of data of selected conditions appears. When [Not applicable] is clicked on, it changes to “Wizard Setup”.



Select the item you are looking for, and click on [Next] button to show the selected data.



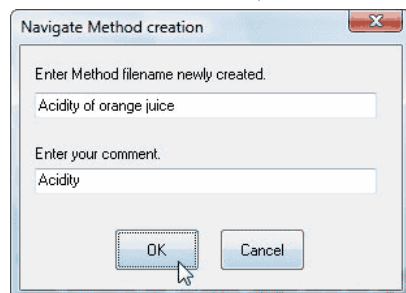
After confirming the displayed contents, click on [Finish] button.



Note:

To view application notes, you need Acrobat Reader 4.0 or later of Adobe Systems Incorporated. You can obtain Acrobat Reader from the homepage of Adobe Systems Incorporated.

Enter Method filename, and click on [OK] button. You can view application notes by clicking [View] button.



<Wizard Setup>

Create Method navigation 3/6

End point number
1

Detection method
Detector No. 1 / mV
Detector No. 1 / pH
Detector No. 2 / mV
Detector No. 3 / mV
Detector No. 3 / pH
Detector No. 3 / %T
Detector No. 3 / Abs.
Detector No. 3 / uA
Detector No. 3 / 100uS
Detector No. 3 / 1000uS
Detector No. 3 / 10000uS

Titration curve shape

Comment
This mode uses "EP Stop" for endpoint detection. Up to 1 number of endpoints is detected.
When potential changes from low to high(Positive), EP is selectively detected.
Detection unit is mV for acid/base (neutralization) titration, redox, precipitation and titration with ion electrode.

Not applicable < Back Next > Cancel Help

[End point Number]

Select a number of endpoints to be detected. Refer to Comment.

[Detection method]

Select the detector number and potential unit. Refer to Comment.

[Titration curve Shape]

Select a shape of titration curve and EP detection method. Refer to Comment.

Create Method navigation 4/6

Titration type: Acid/base titration

Reaction speed: Medium

Sample character: Liquid

Max. volume: 20 mL

Titration burette No.: 1

1st End level: 0 mV

2nd end level: 0 mV

Comment:
Standard preamplifier is used with combination glass electrode
(Ex. C-172, C-181, C-675) for acid/base titration
(hydrochloric acid-sodium hydroxide, sulfuric acid-sodium hydroxide).
Select "Slow" for titration reaction with less than 0.01mol/L solution.

Not applicable < Back Next > Cancel Help

[Titration type]

Select titration types. Refer to Comment.

[Reaction speed]

Select reaction speed. It is necessary to roughly set up reaction of titration liquid with the sample material.

[Sample character]

Define sample type and whether it is liquid or solid.

[Max. volume]

Here you set up the volume to stop titration. Usually, it is the difference in amount between beaker capacity and solvent or expected titration volume +20%.

[Titration burette No.]

Enter the burette number for titration.

[1st End Level]

Select potential for the first endpoint.

[2nd End Level]

Select potential for the second endpoint.

After confirming the displayed contents, click on [Finish] button to show [Navigate Method Creation] dialog box.

Create Method navigation 6/6

Titration parameter		Control parameter	
Titration mode	Auto Titration	EP detected numbers	1
Titration form	EP Stop	Control speed mode	medium
Titration burette No.	1		
Detection method	Detector No.1 / mV		
EP detect direction	Positive		
Max volume (mL)	20.0000		
Titration wait time (sec)	10		

Comment

This mode uses "EP Stop" for endpoint detection. Up to 1 number of endpoints is detected.

When potential changes from low to high(Positive), EP is selectively detected.

Detection unit is mV for acid/base (neutralization) titration, redox, precipitation and titration with ion electrode.

Standard preamplifier is used with combination glass electrode (Ex. C-172, C-181, C-675) for acid/base titration (hydrochloric acid-sodium hydroxide, sulfuric acid-sodium hydroxide). Select "Slow" for titration reaction with less than 0.01mol/L solution.

Click on [Close] button to create Method file as above setting.

Not applicable < Back Finish Cancel Help

Enter Method filename and click on [OK] button.

Navigate Method creation

Enter Method filename newly created.

Acidity of orange juice

Enter your comment.

Acidity

OK Cancel

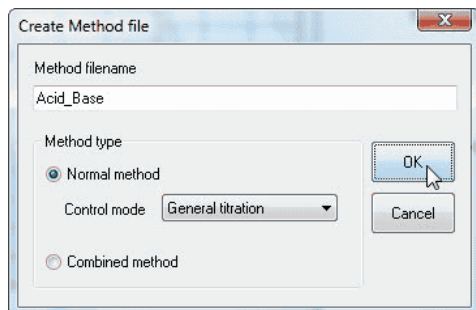
Note:

For Method file setup and edit, refer to 3-6. About Method File.

3-3-4-3. [Create] command

To create a Method file, click on this command to open [Create Method file] dialog box.

Enter Method filename and select Method type. Click on [OK] button to show [Edit Method File] dialog box (Normal method and Combined method).



[Normal Method]

This is Standard Method with control modes selectable as follows

- General titration This type of titration is used for acid/base, redox and precipitation titration.
- Stat titration..... This is specialized for Stat titration used in pH Stat.
- Karl Fischer titration..... This is specialized for Karl Fischer moisture titration.
- COD titration This is specialized for COD (consumption of potassium permanganate at 100°C) measurement.

Note:

Karl Fischer and COD are possible when AT-510 titrator is connected.

[Combined Method]

Up to 5 different Methods can be combined by AT-Win. This is called Combined Method.

The combined method is useful when a sample is measured for a plural number of objectives.

Note:

The combined method cannot be used on the titration programme where AT-700 is connected.

< Normal Method File >

Acidity.ms1 - Edit Method File

Titration / Dose Control Formula Operating Procedure Guide

Titration parameter

Titration mode: Auto Titration

Titration form: EP Stop

Burette No.: 1

Unit filename: Do not use

Detection method: Detector No.1 / mV

Temp. coefficient: 2 %

Max volume: 20 mL

Wait time: 0 sec

Direction: Auto

EP stop mode: Positive

Dose parameter

Dose mode: Off

Burette No.: 1

Unit filename: Do not use

Detection method: Detector No.1 / mV

Temp. coefficient: 2 %

Volume: 20 mL

Level: 0 mV

Differential: 0 mV/mL

Cut-off time: 0 sec

Unit volume: 0.1 mL

Dispense speed: 50 sec/mL

Wait time: 0 sec

Save Close Print

< Combined Method File >

Acidity_Salinity.mc1 - Edit Combined Method File

Group4 Formula Group5 Formula Operating Procedure Guide

Combine Methods Group1 Formula Group2 Formula Group3 Formula

Method file list

- Acidity.ms1
- Salinity.ms1

Method file information

Titration mode : Auto Titration

Titration form : EP Stop

Burette No. : 1

Detection method : Detector No.1 / mV

Dose mode : Off

Gain : 1

↓ Add ↑ Delete

Method filename	Titration burette ...	Detection method
1 Acidity.ms1	1	Detector No.1 / pH
1 Salinity.ms1	2	Detector No.2 / mV

Up Down

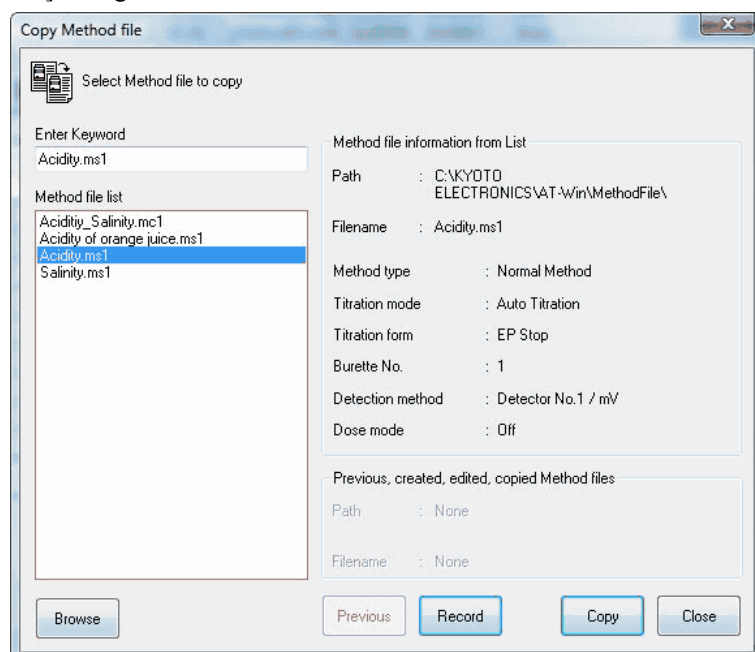
Save Close Print

Note:

For details of each Method file, refer to 3-6. About Method File.

3-3-4-4. [Copy] command

Here you can make another new Method using existing Methods. Click on this command to open [Copy Method file] dialog box. Select a Method filename from the list and click on [Copy] button.



[Browse] button

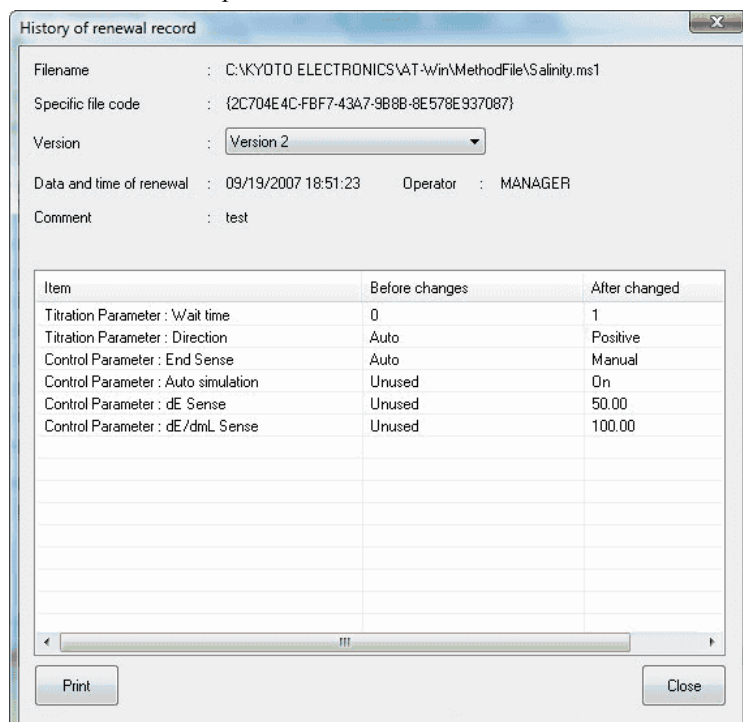
You can change a path (folder where Method file is stored) by clicking this button to show [Browse for Folder] dialog box.

[Previous] button

You cannot select this button.

[Record]

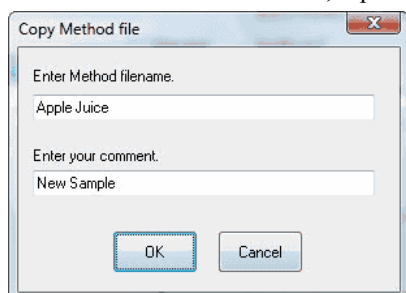
The record of updated Method files are shown here.



[Copy] button

Here you make another new Method using selected Method. Click on this command to open [Copy Method file] dialog box.

Enter a new Method filename, input the reason for copying and click on [OK] button.



Note:

Please be sure to input comments. The data cannot be saved without inputting comments.

[Close] button

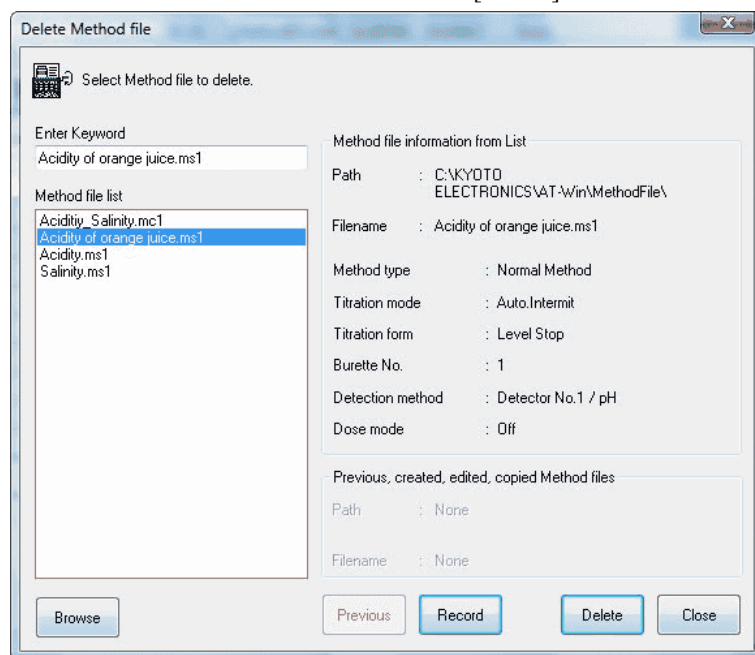
Closes [Copy Method file] dialog box.

Note:

For Method file setup and edit, refer to 3-6. About Method File.

3-3-4-5. [Delete] command

To delete the existing Method files, click on this command to open [Delete Method file] dialog box. Select a Method filename from the list and click on [Delete] button.



[Browse] button

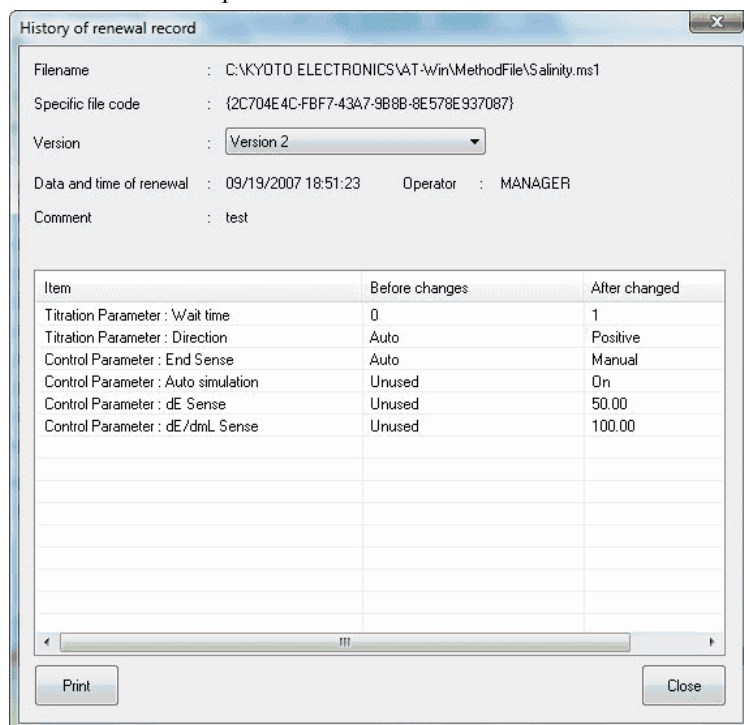
You can change a path (folder where Method file is stored) by clicking this button to show [Browse for Folder] dialog box.

[Previous] button

You cannot select this button.

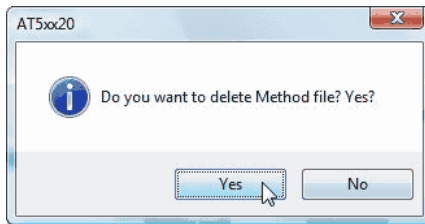
[Record]

The record of updated Method files are shown here.



[Delete] button

The selected Method file is deleted here. Click on this button to open the prompting dialog box. Click on [Yes] button to delete the Method file.



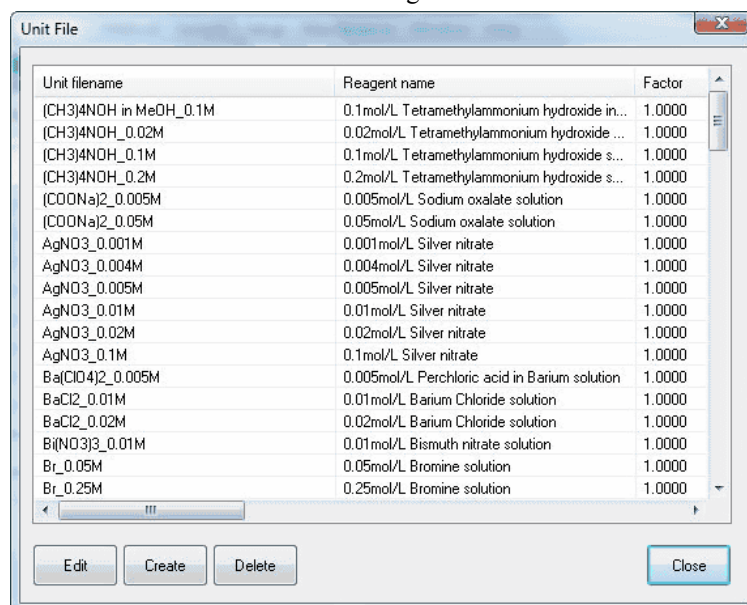
[Close] button

Closes [Delete Method file] dialog box.

3-3-4-6. [Unit File] command

To edit the unit files, click on this command to open [Unit File] dialog box.

Unit File contains information on reagent for titration and fixed dose in [Unit File] dialog box.



[Edit] button

The existing unit files are edited here. Point the cursor on the unit filename in [Unit File] dialog box to open [Edit Unit File] dialog box, which appears when this button is clicked on.

[Create] button

Unit files can be created here by clicking this button when [Edit Unit File] dialog box appears.

[Delete] button

Unit files can be deleted from the list. Point the cursor on the file in the list and click on this button. When prompted by a message, click on [OK].

[Edit Unit File] dialog box

Unit filename: HCL_0.5M

Reagent name: 0.5mol/L Hydrochloric acid

Factor: 1

Temp. comp. coefficient A: 1

Remaining reagent: 1000 mL

Temp. comp. coefficient B: 0

Alarm setting

☒ Lowest volume of reagent less than 50 mL

☒ Next reagent replacement day: 9/10/2007

☒ Next reagent replacement day: 9/10/2007

☒ Next reagent replacement day: 9/10/2007

Auto update interval: 7 Day

Constant1: Today: 9/10/2007

Constant2 (TC2): 0

Constant3 (TC3): 0

Constant4 (TC4): 0

Constant5 (TC5): 0

Constant6 (TC6): 0

Constant7 (TC7): 0

Constant8 (TC8): 0

Constant9 (TC9): 0

Constant10 (TC10): 0

[Unit Filename]

Unit files are named here. When editing existing unit files, the names cannot be changed.

[Reagent name]

Reagent names are defined here.

[Factor]

Enter factor values here.

[Remaining Reagent]

The remaining reagent volume when changing reagent is entered here, it will be deducted from the volume of actual use.

Note:

This remaining volume of reagent is approximate amount and may not precise volume. This is only for the intended purpose.

[Next reagent replacement day]

Set up a day for next reagent replacement. When the day approaches, the display shows an alarm message. After replacement, click on [Update] button and set up another day for the following reagent replacement. The next replacement day is set according to the preset [Auto renewal interval]. Press the dropdown list to show calendar. Select a day for replacement to be programmed in.

[Next piston replacement day]

Set up a day for next piston replacement. When the day approaches, the display shows an alarm message. After replacement, click on [Update] button and set up another day for the following piston replacement.

[Next capacity validation day]

Set up a day for next validation of burette capacity precision. When the day approaches, the display shows an alarm message.

[Temp. comp. coefficient A]

Enter Temperature compensation coefficient A for titration solution. Temperature compensation used here means the volume correction by the temperature of solution.

[Temp. comp. coefficient B]

Enter Temperature compensation coefficient B for titration solution.

<About temperature compensation of titration solution>

The titration volume is corrected when organic solvent like acetic acid, dioxane, ethanol, etc. is used for titration solution. Normally, titration solution is used in titration at the temperature near to the degree when factor was calibrated, however, its volume needs to be corrected when the temperature at time of titration differs largely from calibration (more than +/-3C).

Liquid temperature compensation equation

$$V = V_0 * (1 + A \times \Delta T \times 10^{-3} + B \times \Delta T^2 \times 10^{-6})$$

V : corrected titration volume

V₀ : titration volume

ΔT : (“compensation temperature” - “liquid temperature”)

[Constant >>], [Constant<<] button

Select to view constants.

[Constant]

Set up constants related to the reagent. Constant name can be entered by [Constant Name, Comment] command from [Setup] menu.

Note:

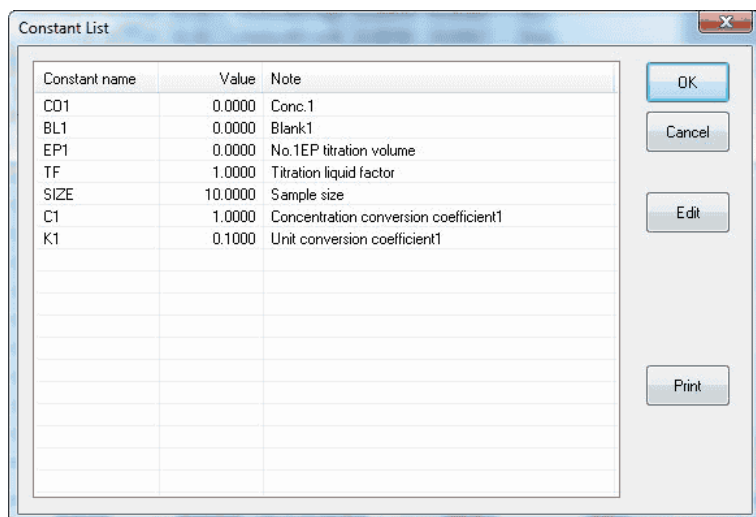
For naming constants, refer to 3-3-6-3. [Constant Name, Comment] command.

3-3-4-7. [Constant] command

Here the constants used in calculation formula in Method can be edited. Click on this command to open [Constant List] dialog box.

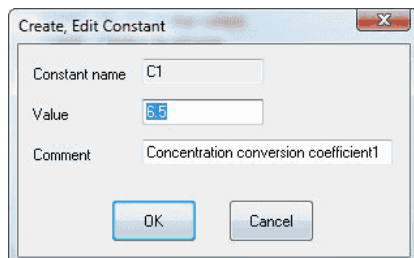
Short cut

Toolbar :



[Edit] button

To change constants (numeric or comment), point the cursor on the constant name to be changed, and click on this button to open [Create, Edit Constant] dialog box. To change numeric value, point the cursor on numeric column and enter the value.

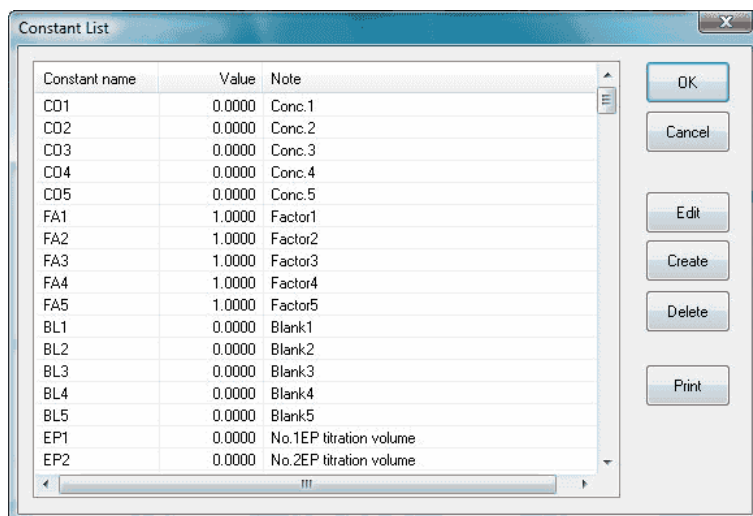


[Print] button

The constants in the list are printed out.

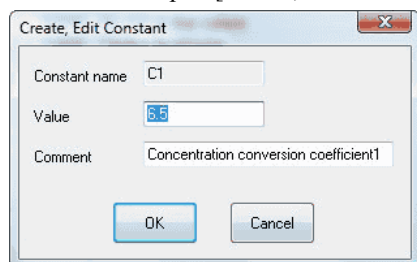
3-3-4-8. [All Constant] command

The constants used in AT-Win can be edited here. Click on this command to open [Constants List] dialog box.



[Edit] button

To change constants (numeric or comment), point the cursor on the constant name to be changed, and click on this button to open [Create, Edit Constant] dialog box.



[Create] button

New constants are entered here. Click on this button to open [Create, Edit Constant] dialog box.

[Delete] button

A constant or constants can be deleted from the list. Point the cursor on the constant name in the list and click on this button. When prompted by a message, click on [OK].

[Print] button

The constants in the list are printed out.

Preset constants

The following constants in below chart are preset in AT-Win. These constants cannot be changed nor deleted.

Constant Name	Note
BL1-BL5	Blank level
BAVE1-BAVE5	Means in Blank measurements (Automatically calculated according to calculation number)
C1-C5	Concentration conversion coefficient
CO1-CO5	Concentration calculated results
DC1-DC10	Fixed dose unit constant
DF	Fixed dose factor
DOSE	Fixed dose volume
ELEV1-ELEV5	EP potential
EP1-EP5	EP titration volume
FA1-FA5	Factor
FI	Final titration volume
FAVE1-FAVE5	Means in Factor measurements (Automatically calculated according to calculation number)
K1-K5	Unit conversion coefficient
PK1-PK5	Dissociation constant (automatically computed out with pKn input in calculation formula)
R	Constant (dilution coefficient is defined)
SC1-SC10	Sample related constant
SIZE	Sample size
TC1-TC10	Titration unit constant
TF	Titration solution factor
TM	Titration time (second)
VT1-VT5	Stat titration volume
PD1-PD5	Pre Dose volume

Note:

PD1-PD5 cannot be used on the titration programme where AT-510, AT-500N or AT-420N is connected.

3-3-5. [Sample] menu

3-3-5-1. [Setup] command

Here you configure sample parameters. Titration program opens [Sample setup] dialog box, which contains 2 modes: Single mode and Sample File mode.

Short cut

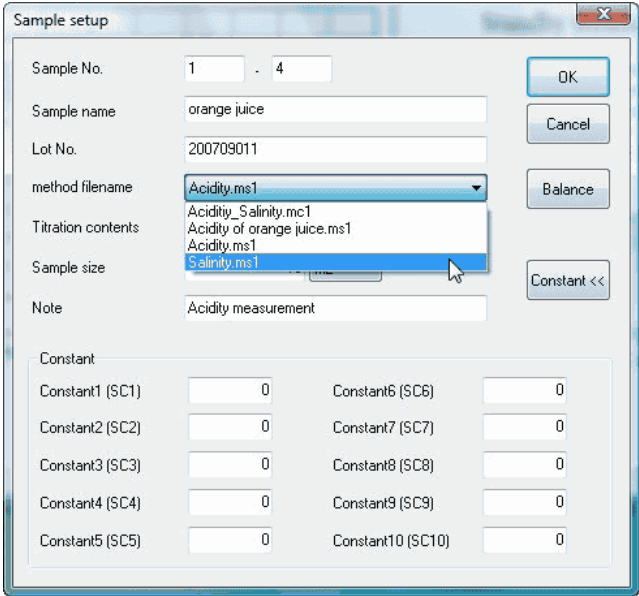
Toolbar



< Single Mode >

This is for single sample measurement.

To set it to Single mode, either check the single mode on toolbar or execute [Single Mode] command from [Setup] menu.

A screenshot of the 'Sample setup' dialog box. It contains fields for 'Sample No.' (1 - 4), 'Sample name' (orange juice), 'Lot No.' (200709011), 'method filename' (Acidity.ms1), 'Titration contents' (Acidity_Salinity.mc1, Acidity of orange juice.ms1, Acidity.ms1, Salinity.ms1), 'Sample size', and 'Note' (Acidity measurement). There are buttons for 'OK', 'Cancel', 'Balance', and 'Constant <<'. At the bottom, there is a section for 'Constant' with ten input fields labeled Constant1 (SC1) through Constant10 (SC10), all set to 0.

[Sample No.]

Sample numbers can be set up here (range: 00-00 - 99-99)

[Sample name]

Here the samples are named.

[Lot No.]

Lot numbers are defined here.

[Method filename]

Select the Method filename for titration. Method file is created from [Method] menu.

[Titration contents]

The details of titration configured with calculation formula for the selected Method file is shown here. (The contents are unchangeable.)

[Sample size]

Here the sample size and unit are set up.

[Constant>>], [Constant<<] button

Select to view or not to view the constants.

[Constant]

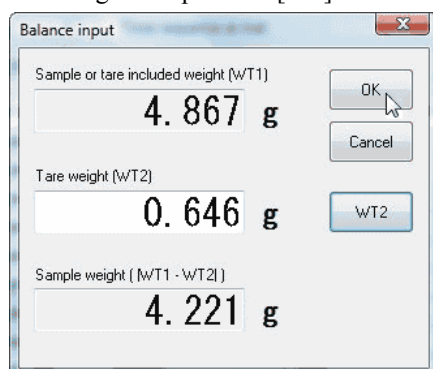
Enter constants related to the sample. The value entered here can be used in calculation.

Sample related constant can be entered by [Sample Constant] command on [Constant Name, Comment] from [Setup] menu.

[Balance] button

Enter weight of sample into the balance. [Balance input] dialog box appears.

The weight is input with [OK] button clicked on.



A screenshot of a 'Balance input' dialog box. The dialog box has a title bar with 'Balance input' and a close button. It contains three input fields with labels and units, and three buttons. The first input field is labeled 'Sample or tare included weight (WT1)' and contains the value '4.867 g'. To its right are 'OK' and 'Cancel' buttons. The second input field is labeled 'Tare weight (WT2)' and contains the value '0.646 g'. To its right is a 'WT2' button. The third input field is labeled 'Sample weight (WT1 - WT2)' and contains the value '4.221 g'.

Field Label	Value	Unit
Sample or tare included weight (WT1)	4.867	g
Tare weight (WT2)	0.646	g
Sample weight (WT1 - WT2)	4.221	g

< Sample File Mode >

This is multiple sample measurement mode with a sampler connected for continuous titration or for samples to be reserved.

No.	High No.	Low No.	Sample name	Lot No.	Sample Size	Method File	Titration co
1	1	1	orange juice	20070911	10.0000	Acidity.ms1	Samp
2	1	2	orange juice	20070911	10.0000	Acidity of orange juice.ms1	Samp
3	1	3	orange juice	20070911	10.0000	Acidity.ms1	Samp
4	1	4	orange juice	20070911	10.0000	Salinity.ms1	Samp
5	1	5	orange juice	20070911	10.0000	Acidity_Salinity.mc1	Samp
6	1	6	orange juice	20070911	10.0000	Acidity.ms1	Samp
7	1	7	orange juice	20070911	10.0000	Acidity.ms1	Samp
8	1	8	orange juice	20070911	10.0000	Acidity.ms1	Samp
9	1	9	orange juice	20070911	10.0000	Acidity.ms1	Samp
10	1	10	orange juice	20070911	10.0000	Acidity.ms1	Samp

[Max number of samples]

Select the maximum number of samples. Range: up to 99.

[Titration sample No.]

Define sample number (currently titrating).

[Sampling unit]

Define the unit for the sampled material.

[Cursor direction]

Define cursor direction for sample parameter input table. When only the sample volume is input, it is convenient to set it to “Down”.

[Sample changer]

Select the multiple sampler to be used.

- Not use Select this when the sampler is not going to be used.
- CHA- Choose this when CHA series of sampler is used.
- CHG- Choose this when CHG series of sampler is used.

Note:

A sample changer cannot be used on the titration programme where AT-700 is connected.

[Sequence Mode]

Select rinse sequence mode for CHA series. It is significant when CHA series is selected. For details of rinse sequence, refer to the manual for the multiple sample changer.

- Standard 1 In titration like acid/base, redox or precipitation, use this mode for rinsing electrode and nozzle by shower at each measurement.
- Standard 2 In titration like acid/base, redox or precipitation, use this mode for rinsing electrode and nozzle by dipping at each measurement.
- Standard 3 This mode is used for shower rinse of electrode and nozzle at each measurement and dip rinse in another solution after all measurements are finished.
- Standard 4 Mainly this mode is useful in non-aqueous titration with shower rinsing and dipping at each measurement.
- User This is user defined customized sequence for rinse cleaning.

[Rinse sequence at start]

Set up rinse sequence at start of titration by [Sequence File] command from [Setup] menu.

[Rinse sequence at the end]

Set up sequence for rinsing when all measurements are finished. Program this by [sequence] command from [Setup] menu.

[High No.]

Define high order number (group number) for samples. Range: 00 - 99.

[Low No.]

Define low order number (individual number) for samples. Range: 00 - 99.

[Sample name]

Name the sample or samples.

[Lot No.]

Define the lot number.

[Sampling Size]

Select the volume for sampling.

[Method File]

Select Method filename to be titrated.

[Titration contents]

The contents of titration configured with calculation formula for the selected Method are shown here. (These contents are unchangeable)

Note:

Sequence mode, rinse sequence at start and rinse sequence at the end cannot be used on the titration programme where AT-700 is connected.

[Constant]

Enter the constant related to the sample, which can be used in calculation formula.

Sample related constants can be defined by [Sample Constant] command of [Constant Name, Comment] from [Setup] menu.

[Open] button

The stored sample files are opened here. With this button clicked on, [Open] dialog box appears. The selected sample files can be opened accordingly.

[Save] button

Sample files are saved here. With this button clicked on, [Save] dialog box appears.

Enter a filename and save it.

[Add] button

Additional line can be added here at the end of sample file.

[Insert] button

Additional line can be inserted at the head of sample setup line where the cursor stays.

[Delete] button

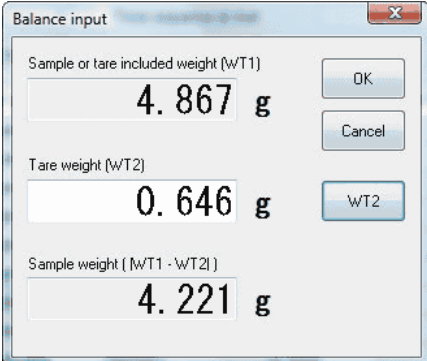
The sample setup line where the cursor stays can be erased here.

[Renumber] button

Starting the lower No. on sample setup line where the cursor is now, the sequential numbers will be automatically assigned on the lower places of the following sample setup lines.

[Balance] button

Enter the weight of sample weighed by a balance. With this button clicked on, [Balance input] dialog box appears. With [OK] button, the weight is input.

A screenshot of a 'Balance input' dialog box. It contains three input fields: 'Sample or tare included weight (WT1)' with the value '4.867 g', 'Tare weight (WT2)' with the value '0.646 g', and 'Sample weight (WT1 - WT2)' with the value '4.221 g'. There are buttons for 'OK', 'Cancel', and 'WT2'.**Note:**

For connecting an electronic balance, refer to 4-1-1. [Connect Balance].

< Changer Mode >

This is multiple sample measurement mode with a sampler connected for continuous titration.

Changer Mode

Sampling unit: Shower: sec Start Mode:

Cursor direction: Rinse: sec

Drain: sec

No.	High No.	Low No.	Sample name	Lot No.	Sample Size	Method File	Titration co
1	1	1			5.0000		
2	1	1			5.0000		
3	1	1			5.0000		
4	1	1			5.0000		
5	1	1			5.0000		
6	1	1			5.0000		

Buttons: Open, Save, Renumber, Balance, Print, OK, Cancel

[Sampling unit]

Define the unit for the sampled material.

[Cursor direction]

Define cursor direction for sample parameter input table. When only the sample volume is input, it is convenient to set it to “Down”.

[Shower time]

Select time length for shower rinsing.

[Dipping time]

Select time length for dip rinse.

[Drain time]

Select time length for draining.

[Start Mode]

Set the operation mode at the starting measurement.

- 1 Measure in order of putting on the table after turning on the power.
- 2 Measure in order of small number of table No. put on the table at the starting measurement, and in order of putting on the table after measurement.

[No.]

These are slot numbers of the carousel of the changer.

[High No.]

Define high order number (group number) for samples. Range: 00 - 99.

[Low No.]

Define low order number (individual number) for samples. Range: 00 - 99.

[Sample name]

Name the sample or samples.

[Lot No.]

Define the lot number.

[Sampling Size]

Select the volume for sampling.

[Method File]

Select Method filename to be titrated.

[Titration contents]

The contents of titration configured with calculation formula for the selected Method are shown here. (These contents are unchangeable)

[Constant]

Enter the constant related to the sample, which can be used in calculation formula.

Sample related constants can be defined by [Sample Constant] command of [Constant Name, Comment] from [Setup] menu.

[Open] button

The stored sample files are opened here. With this button clicked on, [Open] dialog box appears. The selected sample files can be opened accordingly.

[Save] button

Sample files are saved here. With this button clicked on, [Save] dialog box appears.

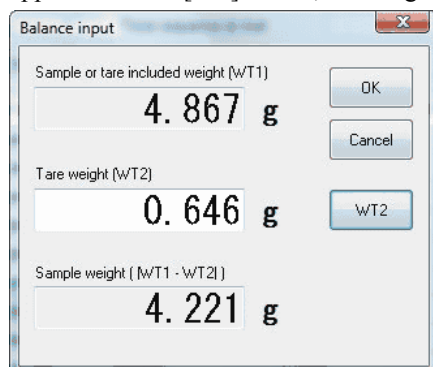
Enter a filename and save it.

[ReNUMBER] button

Starting the lower No. on sample setup line where the cursor is now, the sequential numbers will be automatically assigned on the lower places of the following sample setup lines.

[Balance] button

Enter the weight of sample weighed by a balance. With this button clicked on, [Balance input] dialog box appears. With [OK] button, the weight is input.



A screenshot of a 'Balance input' dialog box. It contains three input fields: 'Sample or tare included weight (WT1)' with the value '4.867 g', 'Tare weight (WT2)' with the value '0.646 g', and 'Sample weight (WT1 - WT2)' with the value '4.221 g'. There are three buttons: 'OK', 'Cancel', and 'WT2'.

Field	Value
Sample or tare included weight (WT1)	4.867 g
Tare weight (WT2)	0.646 g
Sample weight (WT1 - WT2)	4.221 g

Note:

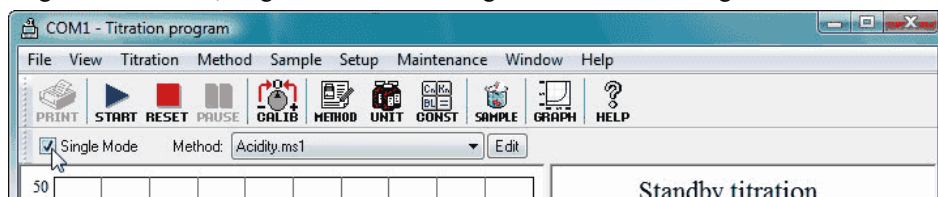
For connecting an electronic balance, refer to 4-1-1. [Connect Balance].

Note:

The changer mode cannot be used on the titration programme where AT-510, AT-500N or AT-420N is connected.

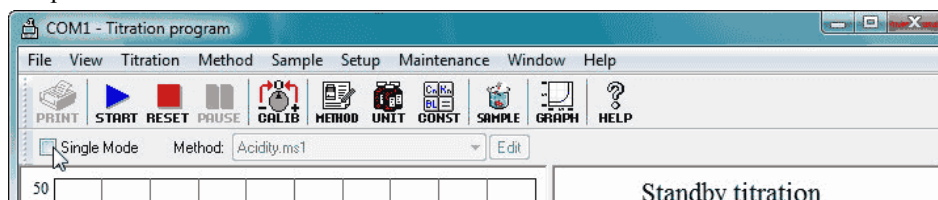
3-3-5-2. [Single Mode] command

Here sample parameters for single measurement are configured. When this command is checked, the mode sets in single mode. Also, single mode becomes significant when the single mode check box on toolbar is checked.



3-3-5-3. [Sample File Mode] command

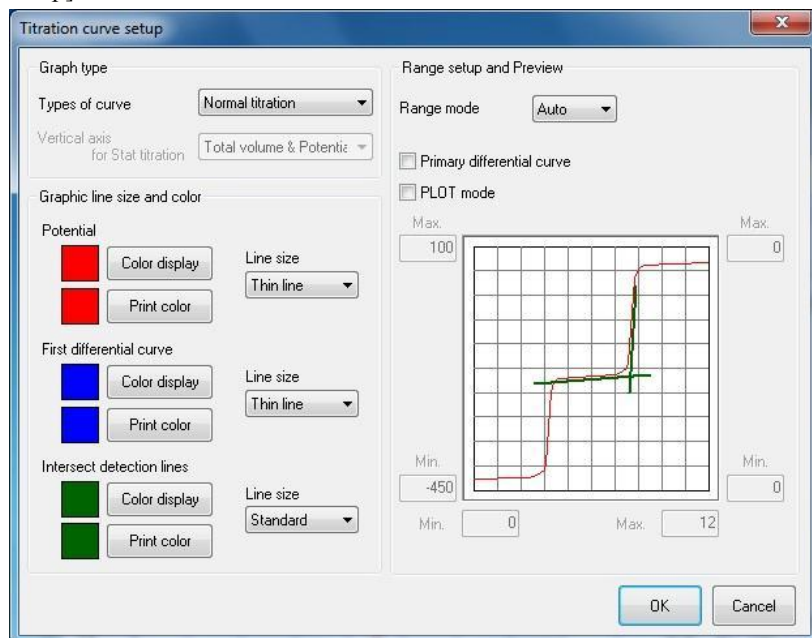
Sample parameters are set up in sample file mode. Check this command to set in sample file mode or check off the sample file mode check box on toolbar.



3-3-6. [Setup] menu

3-3-6-1. [Titration curve] command

Here you select how to show titration curves. Click on this command to show the dialog box [Titration curve setup].



[Types of curve]

Select the type of titration

- Normal titration
- Stat titration

[Vertical axis for Stat titration]

Select the item for vertical axis on Stat titration graph. This appears when Stat is chosen for titration type.

- Total titration volume and actual potential.. Horizontal axis shows time and vertical axis shows total volume.
- Titration volume and actual potential..... Horizontal axis is time and vertical (left) shows actual potential, and vertical (right) shows titration volume.
- Titration volume..... Horizontal axis shows time and vertical axis shows titration volume.

[Range mode]

Enter max./min. of graph range or input manually.

[Max]

Enter max. value for axis. If range mode is auto, it is taken for default value.

[Min]

Enter min. value for axis. If range mode is auto, it is taken for default value.

[Primary differential curve]

This check box will show primary differentiation curve. This will not appear when Stat is selected for titration curve type.

[PLOT Mode]

Stepped titration curve will be plotted per titration volume if you check this check box.

[Color display] button

Select the color for the line on display.

[Print color] button

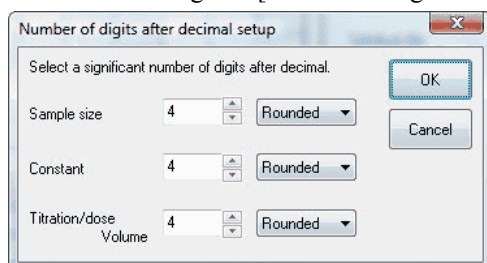
Select color for titration results graph.

[Line size]

Select line size for titration results graph.

3-3-6-2. [Number of digits after decimal] command

Select a number of digits after decimal for sample size, constant and titration/dose volume. Click on this command to show the dialog box [Number of digits after decimal setup].

**[Sample size]**

Select how to treat the number of digits after decimal point and digits after preset digits.

[Constant]

Select how to treat the number of digits after decimal point and digits after preset digits.

[Titration/dose volume]

Select how to treat the number of digits after decimal point and digits after preset digits.

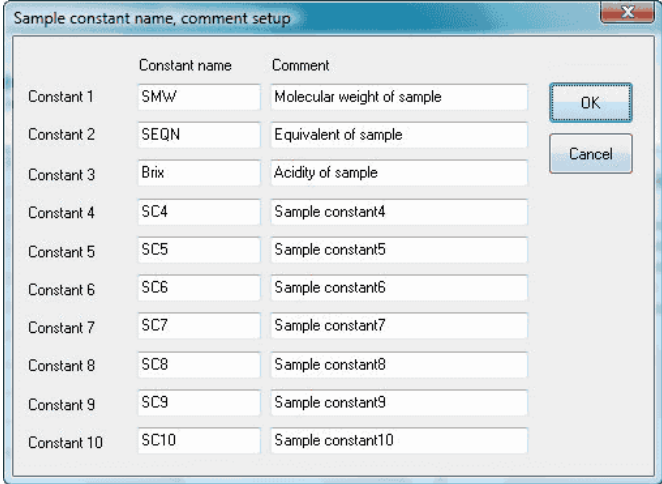
3-3-6-3. [Constant name, Comment] command

In AT-Win software, you can enter on setup screen various constants which depend on sample, titration solution or fixed dose reagent.

Here you select constant name and put comment.

[Sample constant] command

Click on this command to show [Sample constant name, comment setup] dialog box.

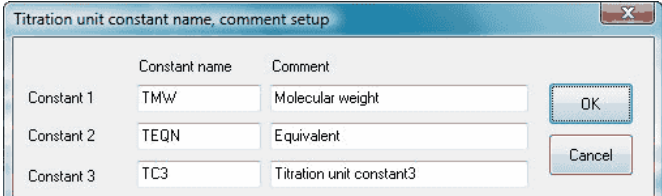


The dialog box titled "Sample constant name, comment setup" contains a table with 10 rows. Each row has a label (Constant 1 to Constant 10), a text field for the constant name, and a text field for the comment. The first three rows have pre-filled names and comments: Constant 1 (SMW, Molecular weight of sample), Constant 2 (SEQN, Equivalent of sample), and Constant 3 (Brix, Acidity of sample). The remaining seven rows have pre-filled names (SC4 to SC10) and generic comments (Sample constant4 to Sample constant10). There are "OK" and "Cancel" buttons on the right side of the dialog.

	Constant name	Comment
Constant 1	SMW	Molecular weight of sample
Constant 2	SEQN	Equivalent of sample
Constant 3	Brix	Acidity of sample
Constant 4	SC4	Sample constant4
Constant 5	SC5	Sample constant5
Constant 6	SC6	Sample constant6
Constant 7	SC7	Sample constant7
Constant 8	SC8	Sample constant8
Constant 9	SC9	Sample constant9
Constant 10	SC10	Sample constant10

[Titration unit constant] command

Click on this command to show [Titration unit constant name, comment setup] dialog box.

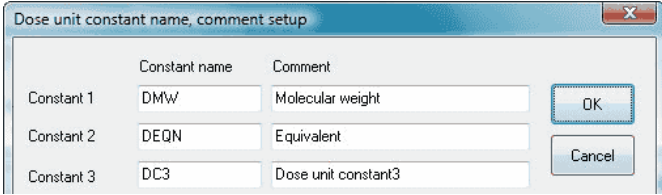


The dialog box titled "Titration unit constant name, comment setup" contains a table with 3 rows. Each row has a label (Constant 1 to Constant 3), a text field for the constant name, and a text field for the comment. The first two rows have pre-filled names and comments: Constant 1 (TMW, Molecular weight) and Constant 2 (TEQN, Equivalent). The third row has a pre-filled name (TC3) and a generic comment (Titration unit constant3). There are "OK" and "Cancel" buttons on the right side of the dialog.

	Constant name	Comment
Constant 1	TMW	Molecular weight
Constant 2	TEQN	Equivalent
Constant 3	TC3	Titration unit constant3

[Dose unit constant] command

Click on this command to show [fixed dose unit constant name, comment setup] dialog box.



The dialog box titled "Dose unit constant name, comment setup" contains a table with 3 rows. Each row has a label (Constant 1 to Constant 3), a text field for the constant name, and a text field for the comment. The first two rows have pre-filled names and comments: Constant 1 (DMW, Molecular weight) and Constant 2 (DEQN, Equivalent). The third row has a pre-filled name (DC3) and a generic comment (Dose unit constant3). There are "OK" and "Cancel" buttons on the right side of the dialog.

	Constant name	Comment
Constant 1	DMW	Molecular weight
Constant 2	DEQN	Equivalent
Constant 3	DC3	Dose unit constant3

The constant name entered here can be used in the equation on Method file. When a value is entered on sample setup or unit file setup, the value is automatically used in calculation for concentration conversion.

3-3-6-4. [Sensor calibration condition] submenu

In AT-Win software, you select conditions for calibrating the titrator. In this submenu, 5 commands are prepared

[Detector No.1/pH] command

Here you configure pH calibration conditions for channel 1 of preamplifier. Click on this command to show [Sensor calibration [pH (ch1)]] dialog box.

In AT-Win there are 2-type pH calibration modes: Auto calibration mode and Manual calibration mode. Auto mode selects pH value of standard liquid automatically at that time. Manual mode enters pH value manually. Selection of mode is made at the time of actual calibration procedure.

Sensor calibration [pH (ch1)]

Auto calibration parameter

Calibration liquid temperature: 25 C

Temperature compensation table: JIS

pH table: [dropdown]

Calibration point: pH7/4

Stability sense level: 3 mV/sec

Manual calibration parameter

Number of calibration point: 2

First calibration point pH value: 0

Second calibration point pH value: 0

Third calibration point pH value: 0

Fourth calibration point pH value: 0

Fifth calibration point pH value: 0

OK Cancel

<Auto calibration parameter>

[Calibration liquid temperature]

Set temperature of pH standard liquid. When a temperature compensation electrode is connected, this setting is ignored, and actual measurement temperature is input.

[Temperature compensation table]

Select the temperature compensation table of pH standard liquid (JIS, ASTM, DIN, BS, NF, NIST, User).

[pH table]

Select the pH standard liquid temperature compensation table when "User" is chosen for temperature compensation table. The pH table is prepared in advance by [pH table file] command from [Setup] menu.

[Calibration point]

Select the pH calibration point.

[Stability sense level]

Select a stability sense level.

<Manual calibration parameter>

[Number of calibration point]

Select a number of pH calibration points.

[First calibration point pH value]

Select the first calibration point pH value in manual calibration.

[Second calibration point pH value]

Select the second calibration point pH value in manual calibration.

[Third calibration point pH value]

Select the third calibration point pH value in manual calibration.

[Fourth calibration point pH value]

Select the forth calibration point pH value in manual calibration.

[Fifth calibration point pH value]

Select the fifth calibration point pH value in manual calibration.

Note:

Fourth and fifth calibration point pH values are available only on AT-700.

[Detector No.3/pH] command

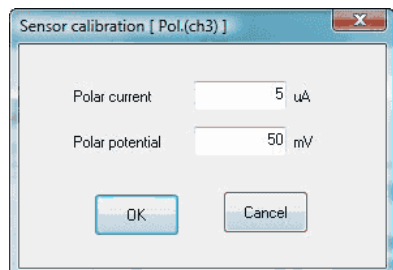
Here you configure pH calibration conditions for channel 3 of 2-way input preamplifier (TET). Click on this command to show [Sensor calibration [pH (ch3)]] dialog box.

[Sensor calibration [pH (ch3)]] dialog box is the same as [Sensor calibration (pH ch 1)] dialog box in [Detector No.1/pH] command.

[Detector No.3/Pol] command

Here you configure calibration conditions for channel 3 of preamplifier (POT) for polarization titration. Click on this command to show [Sensor calibration [Pol. (ch3)]] dialog box.

When preamplifier for polarization titration is connected, it is necessary to calibrate polar current and potential of channel 3. Selection of polar mode is made at time of calibration.



[Polar current]

Select polar current (uA) for constant current polarization.

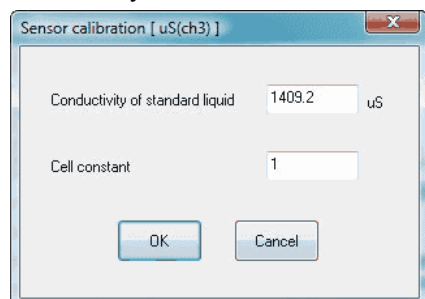
[Polar potential]

Select polar potential (mV) for constant potential polarization.

[Detector No.3/μS] command

Here you configure calibration conditions for channel 3 of preamplifier (CMT) for conductivity titration. Click on this command to show [Sensor calibration [μS (ch3)]] dialog box.

When preamplifier for conductivity titration is connected, it is necessary to select cell constant of channel 3 conductivity cell. Selection of calibration mode is made at time of calibration.



[Conductivity of standard liquid]

Select theoretical conductivity for standard conductivity liquid. This is used when the conductivity cell constant is obtained from standard conductivity. For conductivity of standard liquid, refer to the manual for preamplifier for conductivity titration.

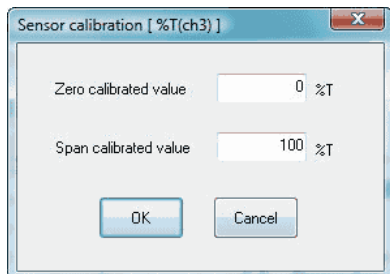
[Cell constant]

Select cell constant for the conductivity cell. The cell constant can be input when the cell constant for conductivity cell is known in advance. After calibration with standard liquid, the determined cell constant is automatically input.

[Detector No.3/%T] command

Here you configure calibration conditions for channel 3 of preamplifier (PTA) for photometric titration. Click on this command to show [Sensor calibration [%T (ch3)]] dialog box.

When preamplifier for photometric titration is connected, it is necessary to calibrate the sensitivity of photometric titration adapter of channel 3.



[Zero calibrated value]

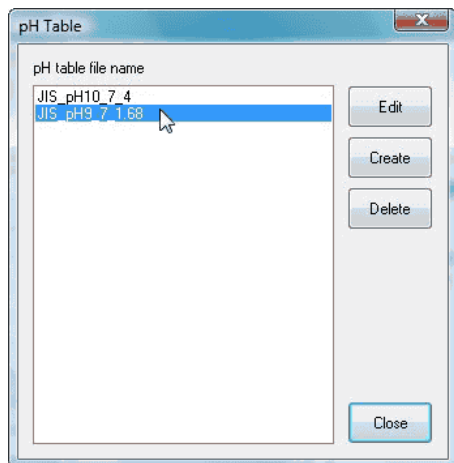
Select zero calibration value for photometric titration adapter. Usually input 0%T.

[Span calibrated value]

Select span calibration value for photometric titration adapter. Usually input 100%T.

3-3-6-5. [pH table file] command

Here you edit or create pH user table file for pH calibration. When this command is clicked on, [pH table] dialog box appears. The purpose of pH table file is to set temperature character of pH standard liquid used in pH sensor calibration for detector No.1 or No.3. The prepared pH table can be used in pH sensor calibration.



[Edit] button

Point the cursor on pH table filename to edit, and click on this button to show [Edit pH table] dialog box.

[Create] button

Here you create new pH table. Click on this button to show [Edit pH table] dialog box.

[Delete] button

Point the cursor on pH table filename to delete, and click on this button to delete the pH table file.

[Edit pH table] dialog box

Edit pH Table

pH table filename

STD buffer1 STD buffer2 STD buffer3 STD buffer4 STD buffer5

Buffer name

	Temperature	pH		Temperature	pH
1.	0	0	11.	50	0
2.	5	0	12.	55	0
3.	10	0	13.	60	0
4.	15	0	14.	70	0
5.	20	0	15.	80	0
6.	25	0	16.	90	0
7.	30	0	17.	95	0
8.	35	0			
9.	40	0			
10.	45	0			

Print OK Cancel

[pH table filename]

Select pH table filename.

[STD buffer 1, 2, 3, 4, 5] tab

Here the pH table to edit is switched.

[Buffer name]

Enter a name of pH standard liquid.

[Temperature], [pH]

Configure the relation of temperature of pH standard liquid and pH value.

Note:

Tabs for STD buffer 4 and STD buffer 5 are available only on AT-700.

3-3-6-6. [Changer] submenu

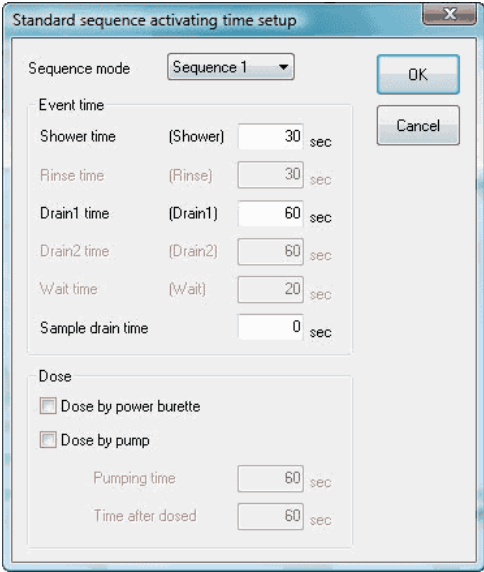
Configure the condition for rinse sequence of the multiple sample changer (CHA-series) by AT-Win. This submenu provides 2 kinds of command ([Standard sequence activating time] and [Sequence file]).

Note:

[Changer] submenu cannot be used on the titration programme where AT-700 is connected.

[Standard sequence activating time] command

Select activating time for each event. When this command is clocked on, [Standard sequence activating time setup] dialog box appears.



The dialog box titled "Standard sequence activating time setup" contains the following elements:

- Sequence mode:** A dropdown menu set to "Sequence 1".
- Event time section:**
 - Shower time (Shower): 30 sec
 - Rinse time (Rinse): 30 sec
 - Drain1 time (Drain1): 60 sec
 - Drain2 time (Drain2): 60 sec
 - Wait time (Wait): 20 sec
 - Sample drain time: 0 sec
- Dose section:**
 - ☒ Dose by power burette
 - ☐ Dose by pump
 - Pumping time: 60 sec
 - Time after dosed: 60 sec
- Buttons:** OK and Cancel.

[Sequence mode]

Select a sequence to be programmed.

[Shower rinse (Shower)]

Select time length for shower rinsing.

[Dipping time (Rinse)]

Select time length for dip rinse.

[Drain time 1 (Drain 1)]

Select time length for draining after shower rinse.

[Drain time 2 (Drain 2)]

Select time length for draining after dip rinse.

[Wait time (Wait)]

Select time length for waiting before start.

[Sample Drain Time]

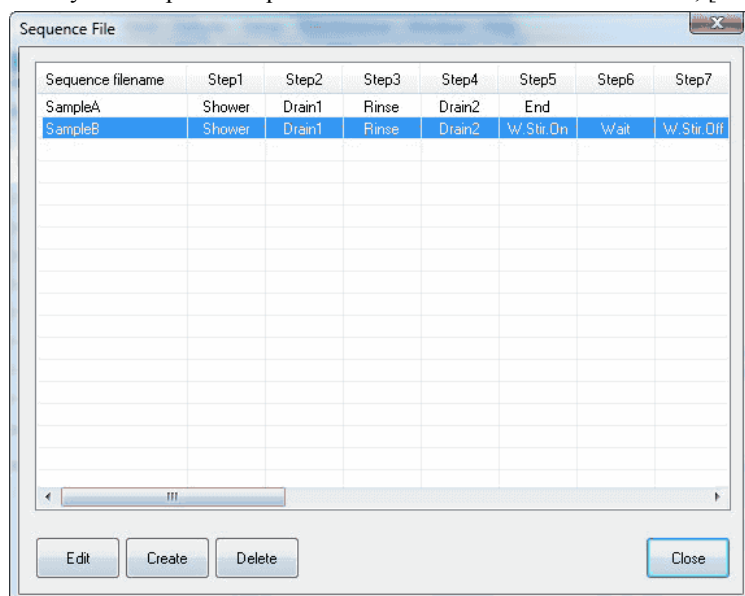
Select time for draining out sample after measurement.

[Dose]

Select or not to use the pump or burette for pre-treatment. Check the check box to make it effective.

[Sequence file] command

Here you set up user sequence. With this command clicked on, [Sequence file] dialog box appears.



[Edit] button

Here you edit sequence files. With this button clicked on, [Sequence file] dialog box appears.

[Create] button

Here you create sequence files. With this button clicked on, [Sequence file] dialog box appears.

[Delete] button

Sequence files can be deleted here.

[Sequence file] dialog box

Sequence File

User sequence file: SampleA

Event time

Shower time (Shower) 30 sec

Rinse time (Rinse) 30 sec

Drain1 time (Drain1) 60 sec

Drain2 time (Drain2) 60 sec

Wait time (Wait) 20 sec

Sample drain time 0 sec

Dose

☐ Dose by power burette

☐ Dose by pump

Pumping time 60 sec

Time after dosed 60 sec

User sequence

1. Shower 11. End

2. Drain1 12. End

3. Rinse 13. End

4. Drain2 14. End

5. End 15. End

6. End 16. End

7. End 17. End

8. End 18. End

9. End 19. End

10. End 20. End

Note

Print OK Cancel

[User sequence file]

Enter filenames for sequence files to be created.

[User sequence]

Program a sequence with the following commands.

- End..... To end the sequence
- Shower Command for shower rinse
- Rinse Dip rinse command
- Drain 1 Drain 1 command
- Drain 2 Drain 2 command
- Wait..... Wait for an event
- W.Stir.On Command to turn on stirrer in rinse bath
- W.Stir.Off..... Command to turn off stirrer in rinse bath
- T.Stir.On..... Command to turn on stirrer at titration position
- T.Stir.Off..... Command to turn off stirrer at titration position

[Event time]

Select activating time of the command for the event preset on user sequence setup.

[Dose]

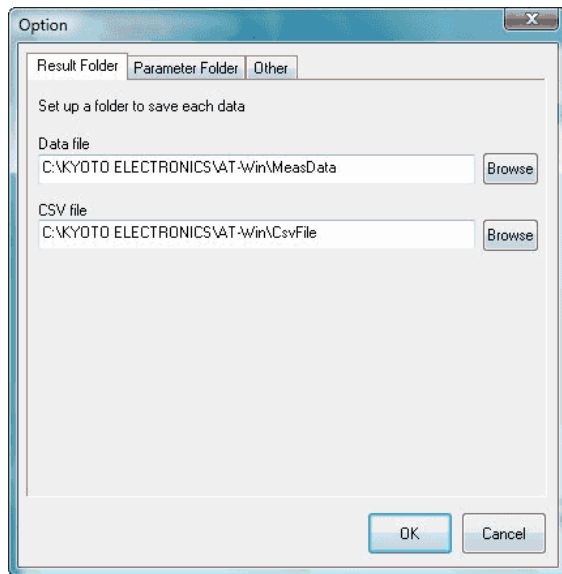
Select fixed dose using sample changer.

[Note]

Information like a comment regarding the sequence.

3-3-6-7. [Option] command

Open [Option] dialog box here. Configure the following settings on this box.



[Result folder] tab

- [Data file]..... Select a folder to store data file.
- [CSV file]..... Select a folder to store data in CSV format.
- [Browse] button..... [Browse for folder] dialog box appears.

[Parameter folder] tab

- [Method file]..... Select a folder to store Method file.
- [Sample file]..... Select a folder to store sample file.
- [Unit file]..... Select a folder to store unit file.
- [Sequence file] Select a folder to store sequence file.
- [pH table file] Select a folder to store pH table file.
- [Browse] button..... [Browse for folder] dialog box appears.

[Other] tab

Here you make settings in general for AT-Win program. Each item becomes effective when checked.

[Make the background color white]

The background color for titration curve, data list and titration information becomes white. It turns to black when checked out.

[Use operating procedure guide]

The operating guide preset on Method file can be made valid.

[Auto renewal of combined Method file]

When the preset contents in combined normal Method are changed, the changes are automatically made in the combined Method.

[Make the alarm function active]

Here you can set the alarm for periodic check, periodic calibration, burette precision validation and etc.

[Auto registration of factor value in unit file]

The mean value after a plural number of consecutive measurements is automatically put into the unit file.

3-3-7. [Maintenance] menu

3-3-7-1. [Periodic calibration / check] command

Here you select the date and interval for periodic sensor calibration and periodic check measurement with standard substance. By checking this command, [Periodic calibration / check setup] dialog box appears.

Periodic calibration / check setup

☒ Periodic calibration [Detector No.1]

Next calibration day: 9/20/2007 Auto update interval: 7 Day

☒ Periodic calibration [Detector No.3]

Next calibration day: 9/20/2007 Auto update interval: 7 Day

☒ Periodic check

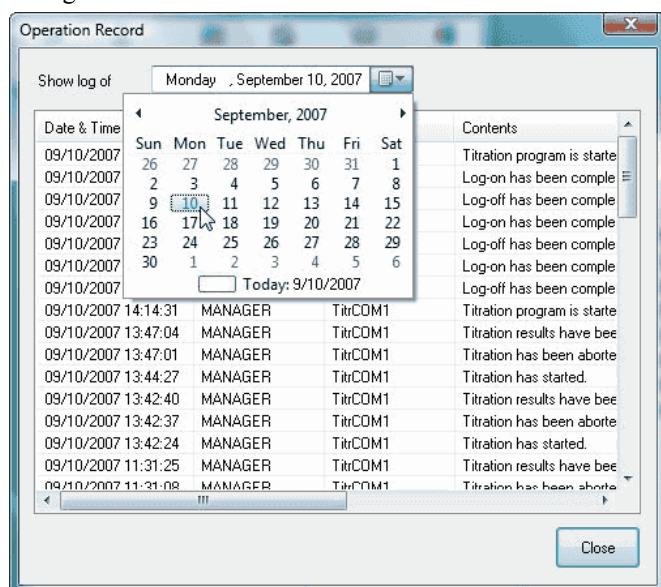
Next check day: 9/20/2007 Auto update interval: 7 Day

OK Cancel

Check each box to activate periodic calibration and check.

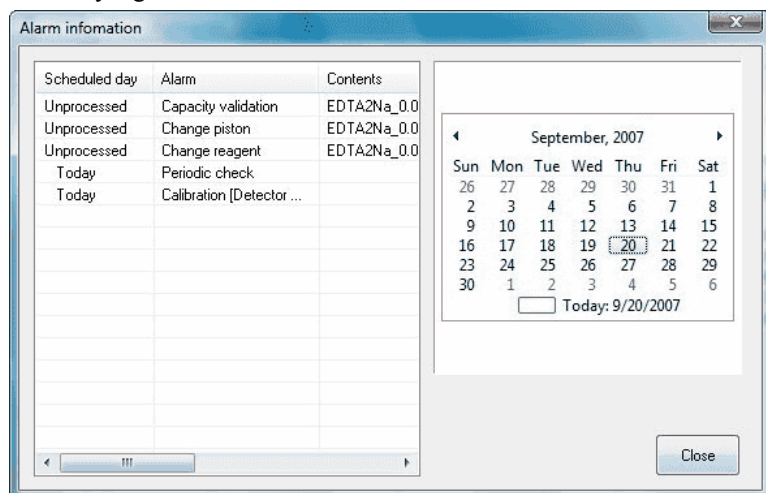
3-3-7-3. [Operation Record] command

The record of past errors and operational events is shown here. Click on this command to show [Operation Record] dialog box.



3-3-7-4. [Alarm] command

Presently significant errors are shown here. Click on this command to show [Alarm information] dialog box.



3-3-8. [Window] menu

3-3-8-1. [Cascade] command

Presently displayed AT-Win programs are superimposed in original size.

3-3-8-2. [Arrange All] command

Presently displayed AT-Win programs are shown in parallel.

3-3-8-3. [Minimize All] command

Presently displayed AT-Win programs are shown the smallest size.

3-3-8-4. [Restore All] command

The minimized AT-Win program displays are enlarged back to original size.

3-3-9. [Help] menu

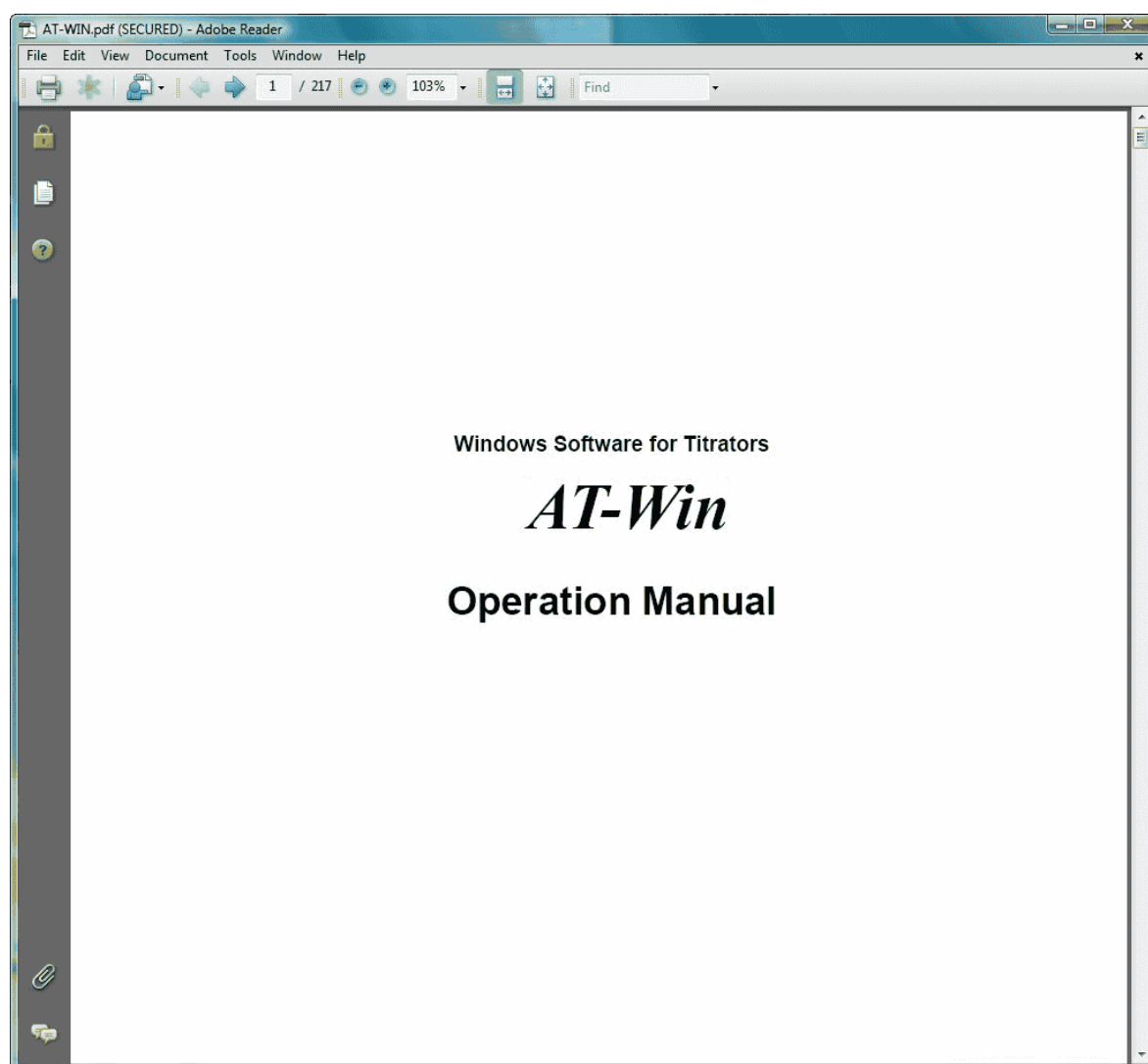
3-3-9-1. [Manual] command

This command shows you the instruction manual in PDF file.

Note:

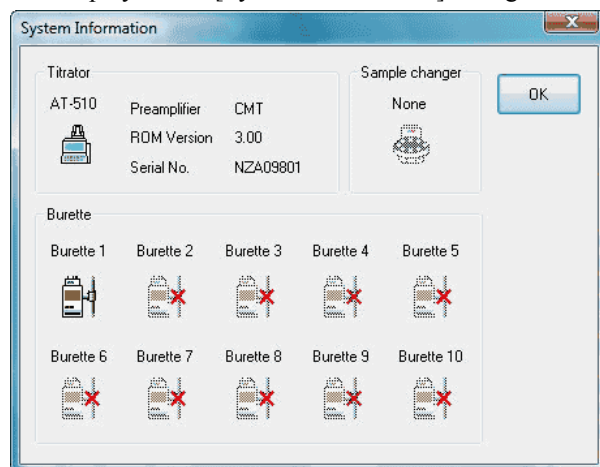
Adobe Reader is necessary to view the manual.

Adobe Reader is the registered trade name of Adobe Systems Incorporated.



3-3-9-2. [System Information] command

The display shows [System Information] dialog box



[Titrator]

It shows the model number, preamplifier type, ROM version and production serial number of the titrator currently used.

[Sample changer]

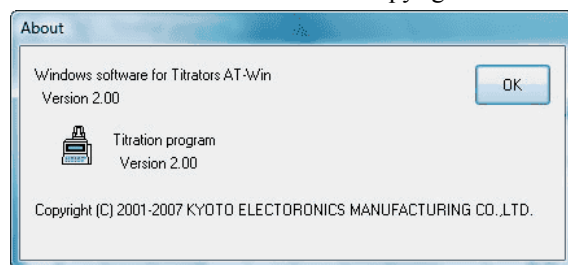
It shows whether a sample changer is connected to the titrator.

[Burette]

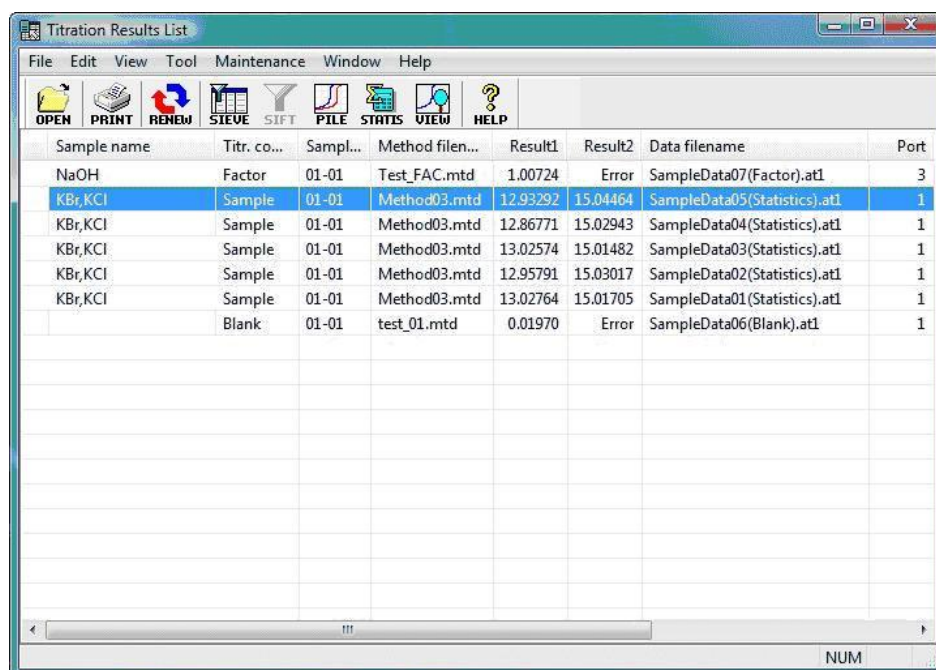
The connected burettes are shown here. If the titrator is AT-510/AT-500N-1, the built-in burette is shown as No.1, and if AT-500N-2, shown as No. 1 and 2.

3-3-9-3. [About] command

It shows the version number and copyright of titration program.



3-4. Results list program



Sample name	Titr. co...	Sampl...	Method file...	Result1	Result2	Data filename	Port
NaOH	Factor	01-01	Test_FAC.mtd	1.00724	Error	SampleData07(Factor).atl	3
KBr,KCl	Sample	01-01	Method03.mtd	12.93292	15.04464	SampleData05(Statistics).atl	1
KBr,KCl	Sample	01-01	Method03.mtd	12.86771	15.02943	SampleData04(Statistics).atl	1
KBr,KCl	Sample	01-01	Method03.mtd	13.02574	15.01482	SampleData03(Statistics).atl	1
KBr,KCl	Sample	01-01	Method03.mtd	12.95791	15.03017	SampleData02(Statistics).atl	1
KBr,KCl	Sample	01-01	Method03.mtd	13.02764	15.01705	SampleData01(Statistics).atl	1
	Blank	01-01	test_01.mtd	0.01970	Error	SampleData06(Blank).atl	1

[File] menu

- Open : Start analysis program for selected titration data.
- Print Layout : Set up printing items and format for titration data
- Print : Print titration data
- Print preview : Preview of printout
- Printer setup : Selection of printer and connecting configuration
- Convert list : Convert titration data to different file type
- Exit : Finish the results list program

[Edit] menu

- Select all : Select all titration data

[View] menu

- Customize list : Customize titration data list
- Refresh : Update titration data list
- Toolbar : Specify toolbar
- Statusbar : Select to view or not status bar

[Tool] menu

- Sorting Condition : Sort out titration data
- Execute / Cancel Sorting : Execute or cancel sorting titration data
- Superimpose : Pile up titration curves on screen
- Statistics : Batch calculation of titration data
- View graph : View of graph
- Option : Set up saving folder for Method file, sample file and data file

[Maintenance] menu

Operation Record : Shows past record of operation, alarms and errors

[Window] menu

Cascade : Presently displayed AT-Win programs are superimposed in original size

Arrange All : Presently displayed AT-Win programs are shown in parallel

Minimize All : Presently displayed AT-Win programs are shown in the smallest size

Restore All : The minimized AT-Win program displays are enlarged back to original size

[Help] menu

Manual : Shows operation manual

About : Shows software version number of the results list program

3-4-1. [File] menu

3-4-1-1. [Open] command

Opens titration data selected from data list. Click on this command to execute Analysis Program for each data.

Short cut

Toolbar

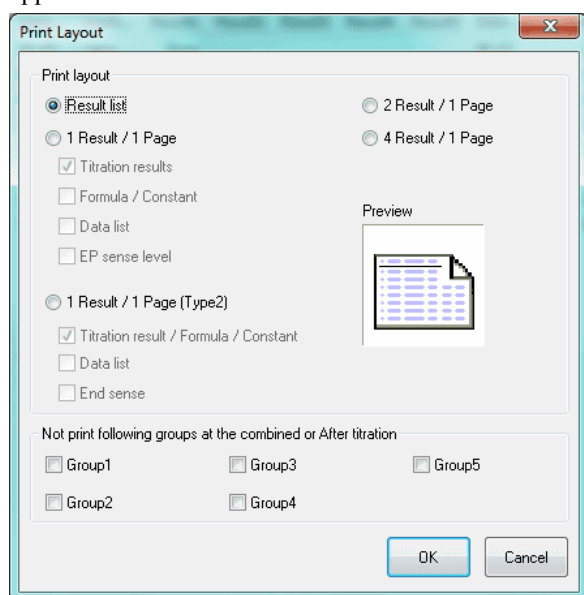


Note:

For the analysis program for each titration data, see 3-5. Analysis Program.

3-4-1-2. [Print Layout] command

Here you configure printed items and format. When this command is executed, [Print Layout] dialog box appears.



[Result list]

It prints out titration data in a chart form.

[1 Result / 1 page (Type1)]

One resulting data is printed out on a sheet of paper.

- | | | |
|--------------------|---|--|
| Titration results | : | If this item is checked, the printed titration data include the results. |
| Formula / Constant | : | If this item is checked, the printed titration data include calculation formula and constant list. |
| Data list | : | If this item is checked, the printed titration data include the data list. |
| EP sense level | : | If this item is checked, the printed titration data include EP sense level. |

[1 Result / 1 page (Type2)]

One resulting data is printed out on a sheet of paper.

- | | | |
|--|---|---|
| Titration results / Formula / Constant | : | If this item is checked, the printed titration data include the results, calculation formula and constant list. |
| Data list | : | If this item is checked, the printed titration data include the data list. |
| EP sense level | : | If this item is checked, the printed titration data include EP sense level. |

[2 Results / 1 page]

Two resulting data are printed out on a sheet of paper.

[4 Results / 1 page]

Four resulting data are printed out on a sheet of paper.

< Not print following groups at the combined or after titration >


[Groups 1, 2, 3, 4, 5]

When this box is checked, the groups checked are not printed out at the combined or after titration.

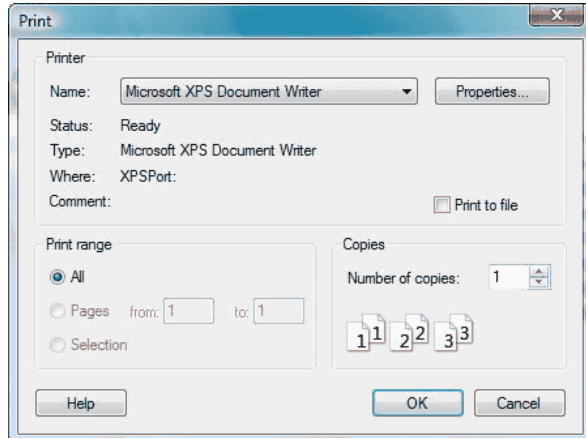
3-4-1-3. [Print] command

It prints out selected data. [Print] dialog box appears to set up the number of pages, printer type to use, etc.

Short cut

Toolbar : 

Keyboard [CTRL] + [P]



[Printer]

Presently selected printer and its port are shown here. If you want to change printer or its connection, select it from [Name] box.

[Print range]

Select the pages you want to print out.

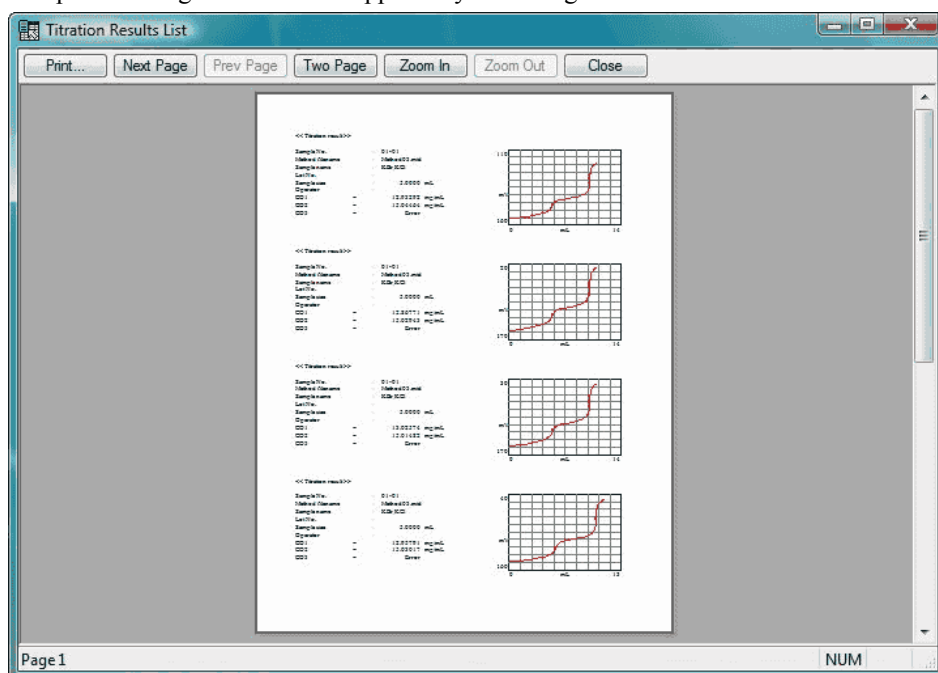
- All : Prints out all pages
- Selected pages : Prints out pages within selected range
- Selection : Not applicable

Note:

[Print] dialog box may differ according to your Windows or printer.

3-4-1-4. [Print preview] command

The printed image of the screen appears by executing this command.



[Print]

It shows [Print] dialog box to start printing.

[Next Page]

It shows the next page to preview.

[Prev Page]

It shows the previous page to preview.

[... Page]

Change the number of pages to review.

[Zoom in]

It enlarges presently displayed page.

[Zoom out]

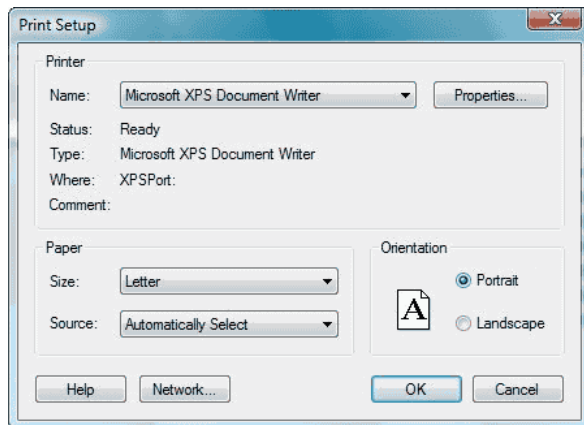
It zooms out presently displayed page.

[Close]

It closes the preview and returns to Main.

3-4-1-5. [Printer setup] command

Here you set up printer selection and connections.



[Printer Name]

If there is more than one printer available, the printer of your choice can be selected from the dropdown list box. If you want to install a new printer or printer port, go to the control panel of Windows referring to its manual.

[Orientation]

Set print sheet direction to Portrait.

[Paper Size]

Choose A4 size or Letter.

[Paper source]

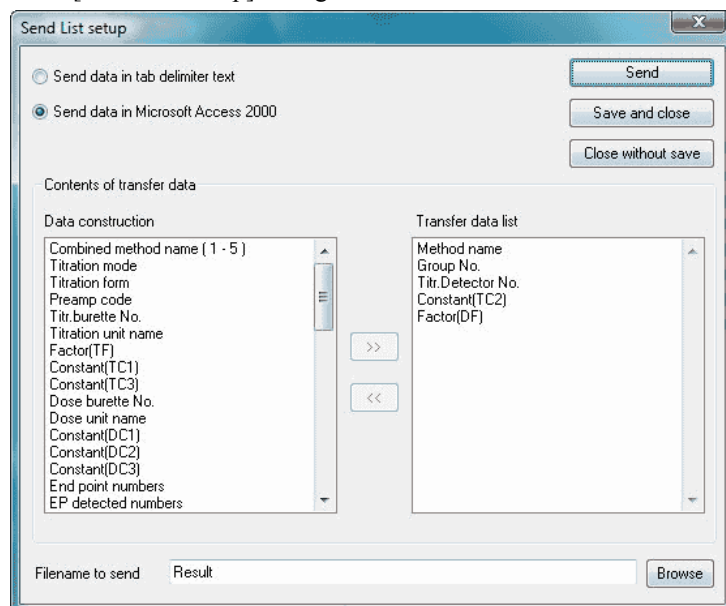
If there is more than one paper tray, select one.

Note:

[Printer Setup] dialog box may differ according to your Windows or printer.

3-4-1-6. [Convert list] command

Selected titration data are edited into a list and converted into a format of your choice. Click on this command to show [Send List setup] dialog box.



[Send data in tab delimiter text]

The data is converted into text format. The file in this format can be read by Microsoft Excel and other spread sheet software.

[Send data in Microsoft Access 2000]

The data is converted into Microsoft Access with (*.mdb) extension. The stored data cannot be read by older version (e.g., Access 97) than Microsoft Access 2000.

[Send] button

Execute sending data.

[Save and close]

The settings are saved and the dialog box is closed.

[Close without save]

The dialog box is closed without saving data.

[Filename to send]

Enter the filename to send.

[Browse] button

Select Save in file where the data is sent and stored.

3-4-1-7. [Exit] command

Close the results list program. This command ends the analysis program.

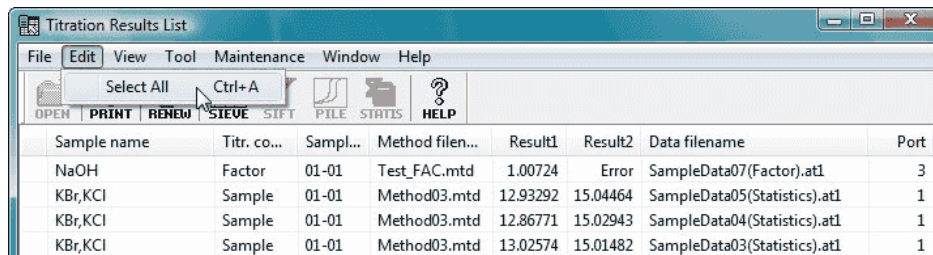
Short cut

Keyboard [ALT] + [F4]

3-4-2. [Edit] menu

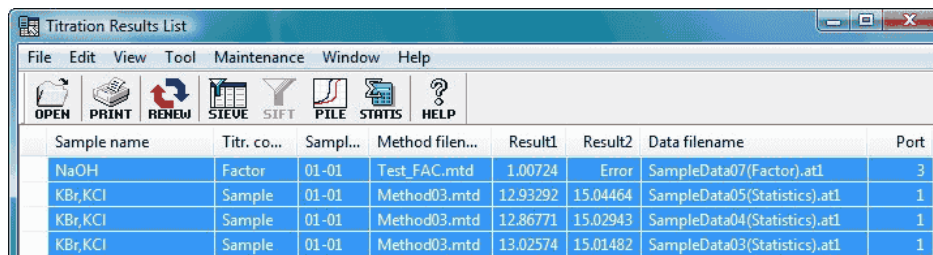
3-4-2-1. [Select all] command

All data lists are ready to be selected. By clicking on this command, all the titration data are selected and listed up.



The screenshot shows the 'Titration Results List' application window. The 'Edit' menu is open, and the 'Select All' option (with the keyboard shortcut Ctrl+A) is highlighted. The main data table is visible below the menu.

Sample name	Tit. co...	Sampl...	Method file...	Result1	Result2	Data filename	Port
NaOH	Factor	01-01	Test_FAC.mtd	1.00724	Error	SampleData07(Factor).atl	3
KBr,KCl	Sample	01-01	Method03.mtd	12.93292	15.04464	SampleData05(Statistics).atl	1
KBr,KCl	Sample	01-01	Method03.mtd	12.86771	15.02943	SampleData04(Statistics).atl	1
KBr,KCl	Sample	01-01	Method03.mtd	13.02574	15.01482	SampleData03(Statistics).atl	1



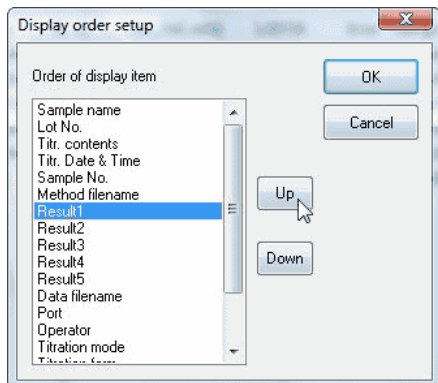
The screenshot shows the same 'Titration Results List' application window, but now all rows in the data table are selected, indicated by a blue highlight. The 'Edit' menu is no longer open.

Sample name	Tit. co...	Sampl...	Method file...	Result1	Result2	Data filename	Port
NaOH	Factor	01-01	Test_FAC.mtd	1.00724	Error	SampleData07(Factor).atl	3
KBr,KCl	Sample	01-01	Method03.mtd	12.93292	15.04464	SampleData05(Statistics).atl	1
KBr,KCl	Sample	01-01	Method03.mtd	12.86771	15.02943	SampleData04(Statistics).atl	1
KBr,KCl	Sample	01-01	Method03.mtd	13.02574	15.01482	SampleData03(Statistics).atl	1

3-4-3. [View] menu

3-4-3-1. [Customize list] command

Configure the contents of display by the results list program. Clicking on this command shows [Display order setup] dialog box.




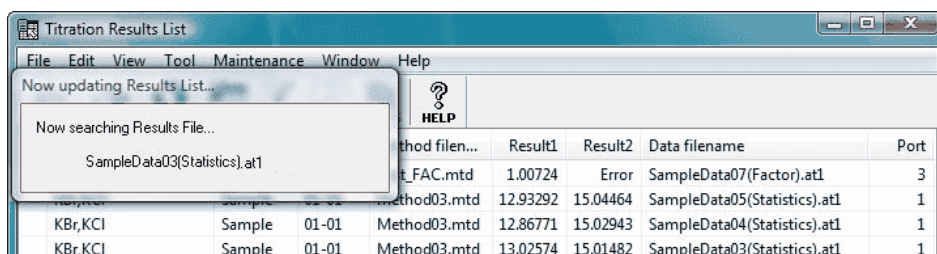
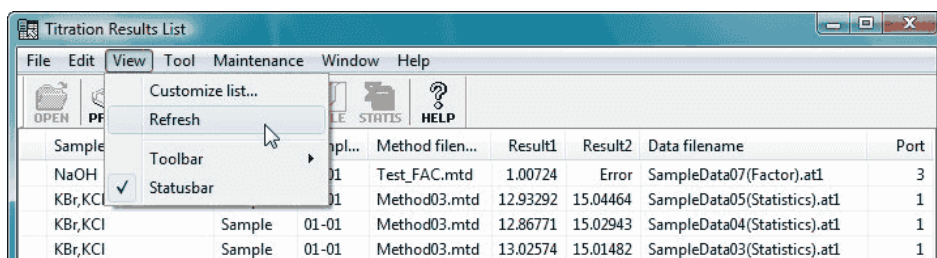
Select the item for display and make order of display with [Up], [Down] key. The list of items in new order is confirmed with [OK] button.

3-4-3-2. [Refresh] command

Here the display of the results list program is updated. This command updates the titration data list in the data folder selected by [Option] from [Tool] menu.

Short cut

Toolbar : 

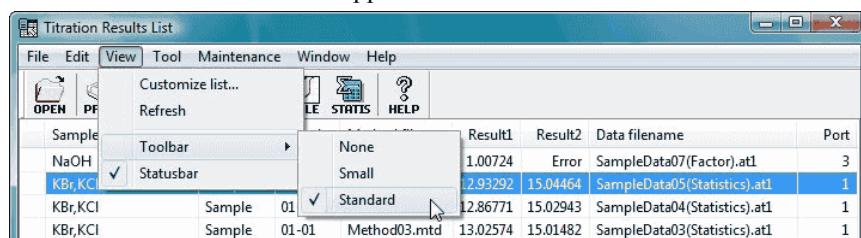


Note:

For setting a folder to save titration data, refer to 3-4-4-5. [Option] command.

3-4-3-3. [Toolbar] command

Select to view the toolbar or not. Toolbar contains a tool like [Open..], which is also frequently used for titration data. The active toolbar item appears with a check mark on it.



<Tool button>

Tool button	Function
	Opens selected titration data by Analysis Program. This button works in the same way as [Open] command in [File] menu.
	Prints titration data. This button works in the same way as [Print] command in [File] menu.
	The list of results data is updated here. This function is the same as [Refresh] from [View] menu.
	Selects data from the results list. This button works in the same way as [Sorting Condition] command in [Tool] menu.
	Execute selection of data. This button works in the same way as [Execute / Cancel Sorting] command in [Tool] menu.
	Here the data are superimposed. This button works in the same way as [Superimpose] command in [Tool] menu.
	Executes batch calculation under the same condition as for selected titration data. This button works in the same way as [Statistics] command in [Tool] menu.
	Shows graph of selected titration data. This button works in the same way as [View Graph] command in [Tool] menu.
	Shows operation manual works just like [Manual] command in [Help] menu.

3-4-3-4. [Statusbar] command

Select or not to view status bar.

On the left side of status bar, simple explanation of each menu command appears when selected. Likewise, such explanation appears when toolbar is pressed on. If you do not want to execute the command, point the mouse on the toolbar button and move it away.

On the right side of status bar, the following keys are shown with their ON/OFF status.

Display	Description
CAP	[Caps Lock] key is ON
NUM	[Num Lock] key is ON
SCRL	[Scroll Lock] key is ON


When status bar is shown, check mark appears on side of command name.

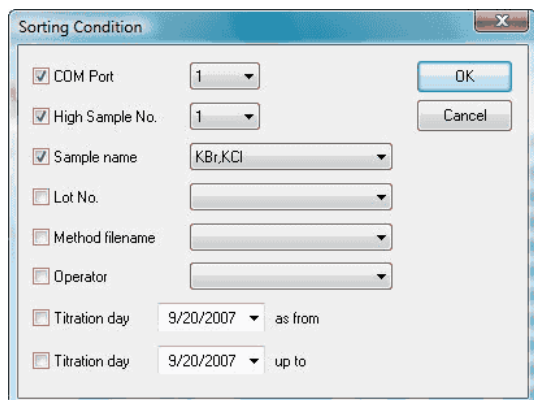
3-4-4. [Tool] menu

3-4-4-1. [Sorting Condition] command

Select conditions to sift titration data. [Sorting Condition] dialog box appears when this command is executed.

Short cut

Tool button : 



The 'Sorting Condition' dialog box contains the following fields and controls:

- ☒ COM Port: 1 (dropdown), OK button
- ☒ High Sample No.: 1 (dropdown), Cancel button
- ☒ Sample name: KBr.KCl (dropdown)
- ☐ Lot No.: (dropdown)
- ☐ Method filename: (dropdown)
- ☐ Operator: (dropdown)
- ☐ Titration day: 9/20/2007 (dropdown) as from
- ☐ Titration day: 9/20/2007 (dropdown) up to

[COM Port]

When this item is checked, COM port number is added to the sift condition. Select COM port from the dropdown list box.

[High Sample No.]

When this item is checked, high order sample number is added to the sift condition. Select high order sample number from the dropdown list box.

[Sample name]

When this item is checked, sample name is added to the sift condition. Select sample name from the dropdown list box.

[Lot No.]

When this item is checked, Lot number is added to the sift condition. Select Lot number from the dropdown list box.

[Method filename]

When this item is checked, Method filename is added to the sift condition. Select Method filename from the dropdown list box.

[Operator]

When this item is checked, operator name is added to the sift condition. Select operator name from the dropdown list box.

[Titration day as from]

When this item is checked, titration day is added to the sift condition. Select titration day from the dropdown list box. Data as from the selected day are sifted.

[Titration dayup to]

When this item is checked, titration day is added to the sift condition. Select titration day from the dropdown list box. Data up to the selected day are sifted.

3-4-4-2. [Execute / Cancel Sorting] command

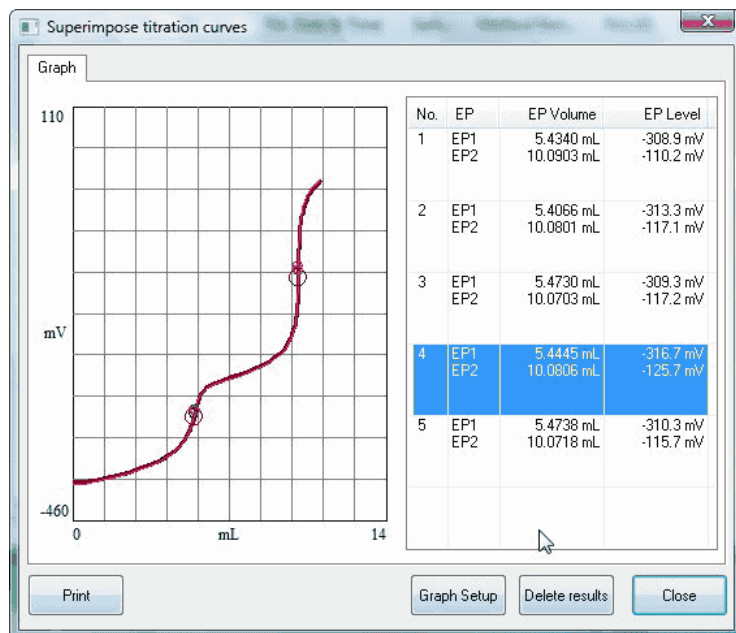
Data sort/cancellation is executed here. This command will start sorting or canceling titration data of less specific use.

3-4-4-3. [Superimpose] command

Here the data are superimposed. Select data to superimpose (more than one data can be selected). By clicking on [Superimpose] command, [Superimpose titration curves] dialog box appears.

Short cut

Toolbar : 



Select data to be added from the data list, and click on [Superimpose] command from [Tool] menu so that the selected data is added then.

[Print] button

Superimposed titration data are printed out.

[Graph setup] button

The color and range of superimposed titration curves can be changed here.

[Delete results] button

Data can be deleted from the superimposed data.

Note:

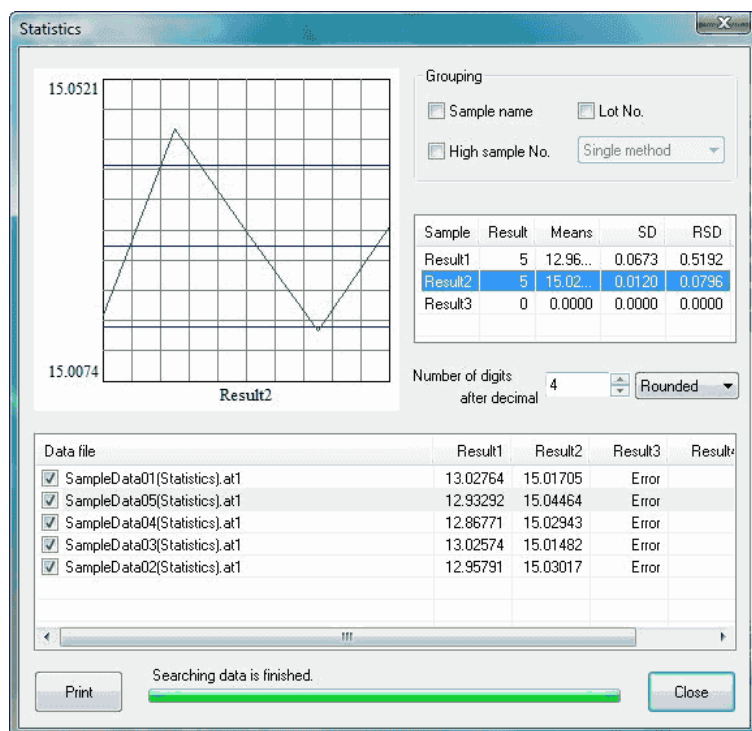
Measurement data of AT-700 cannot be superimposed on those of AT-510, AT-500N or AT-420N.

3-4-4-4. [Statistics] command

Here the titration data are computed into statistical data. Select data you want to batch calculate. Click on [Statistics] command from [Tool] menu to show [Statistics] dialog box.

Short cut

Toolbar



[Grouping]

Sift data for batch calculation by selecting sample name, Lot number and high order sample number.

[Statistical results]

The results of computation are shown here.

[Number of digits after decimal]

Select a number of digits after decimal point for statistical results.

[Target files]

Titration data filenames and data for batch calculation are shown here. If you check those filenames you do not want, they will be excluded from statistics.

[Print] button

The results of batch calculation are printed out. The data excluded from computation are shown with "*" mark on printout.

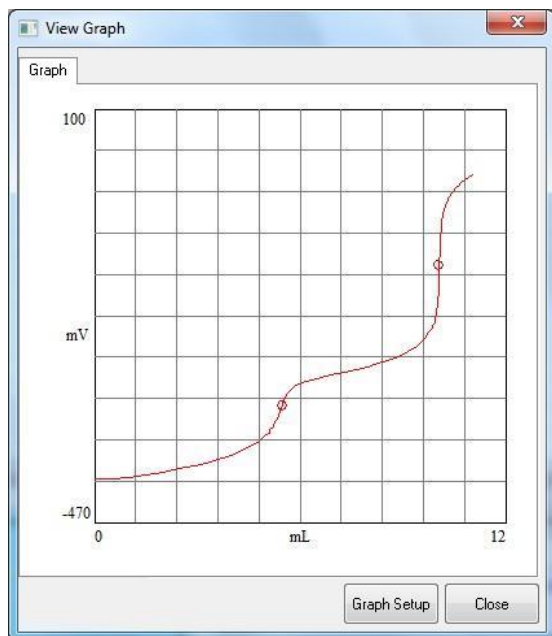
Further data can be sifted by checking items for group conditions. When the result 1... is clicked on in sample string on the list of statistical results, the graph will be replaced, and if check on result filename is erased, the data will be deleted from the statistical results.

3-4-4-5. [View Graph] command

Shows graph of selected titration data. Select data to View Graph. By clicking on [View Graph] command, [View Graph] dialog box appears.

Short cut

Toolbar

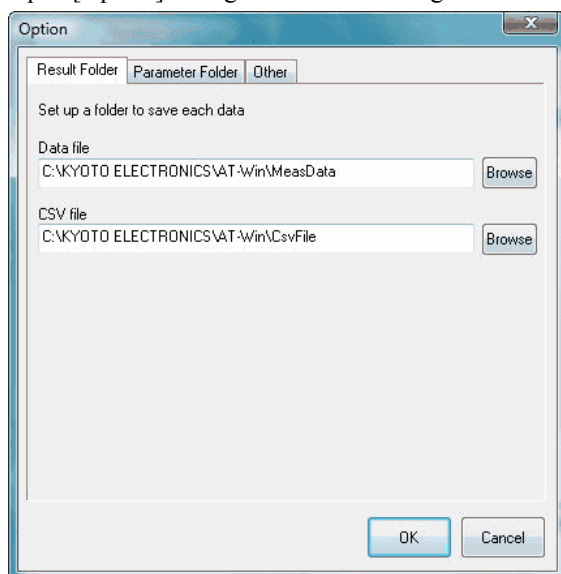


[Graph setup] button

The range of titration curve can be changed here.

3-4-4-6. [Option] command

Open [Option] dialog box here. Configure the following settings on this box.



[Result folder] tab

- [Data file]Select a folder to store data file.
- [CSV file]Select a folder to store data in CSV format.
- [Browse] button[Browse for folder] dialog box appears.

[Parameter folder] tab

- [Method file]Select a folder to store Method file.
- [Sample file]Select a folder to store sample file.
- [Unit file]Select a folder to store unit file.
- [Sequence file]Select a folder to store sequence file.
- [pH table file]Select a folder to store pH table file.
- [Browse] button[Browse for folder] dialog box appears.

[Other] tab

Here you make settings in general for AT-Win program. Each item becomes effective when checked.

[Make the background color white]

The background color for titration curve, data list and titration information becomes white. It turns to black when checked out.

[Use operating procedure guide]

The operating guide preset on Method file can be made valid.

[Auto renewal of combined Method file]

When the preset contents in combined normal Method are changed, the changes are automatically made in the combined Method.

[Make the alarm function active]

Here you can set the alarm for periodic check, periodic calibration, burette precision validation and etc.

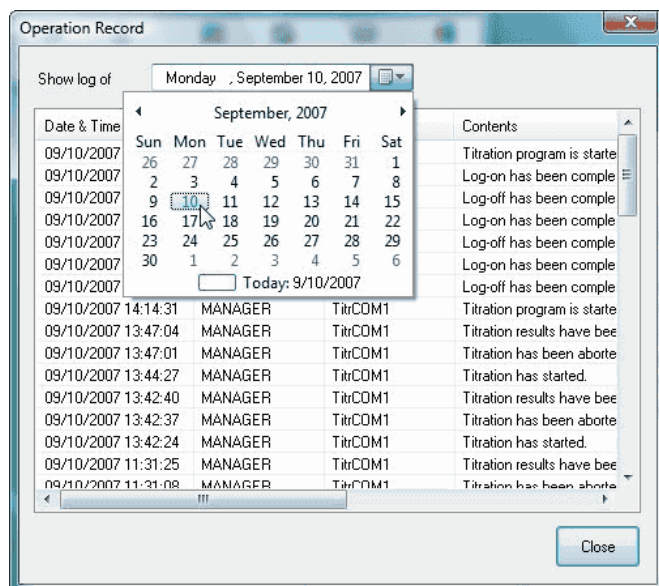
[Auto registration of factor value in unit file]

The mean value after a plural number of consecutive measurements is automatically put into the unit file.

3-4-5. [Maintenance] menu

3-4-5-1. [Operation Record] command

It shows the record of past errors and operational history. This command opens [Operation Record] dialog box when clicked on.



3-4-6. [Window] menu

3-4-6-1. [Cascade] command

The displays of AT-Win program are shown superimposed in original size.

3-4-6-2. [Arrange All] command

The displays of AT-Win program are shown in parallel.

3-4-6-3. [Minimize All] command

The displays of AT-Win program are shown in minimized size.

3-4-6-4. [Restore All] command

The minimized displays of AT-Win program are enlarged back to original size.

3-4-7. [Help] menu

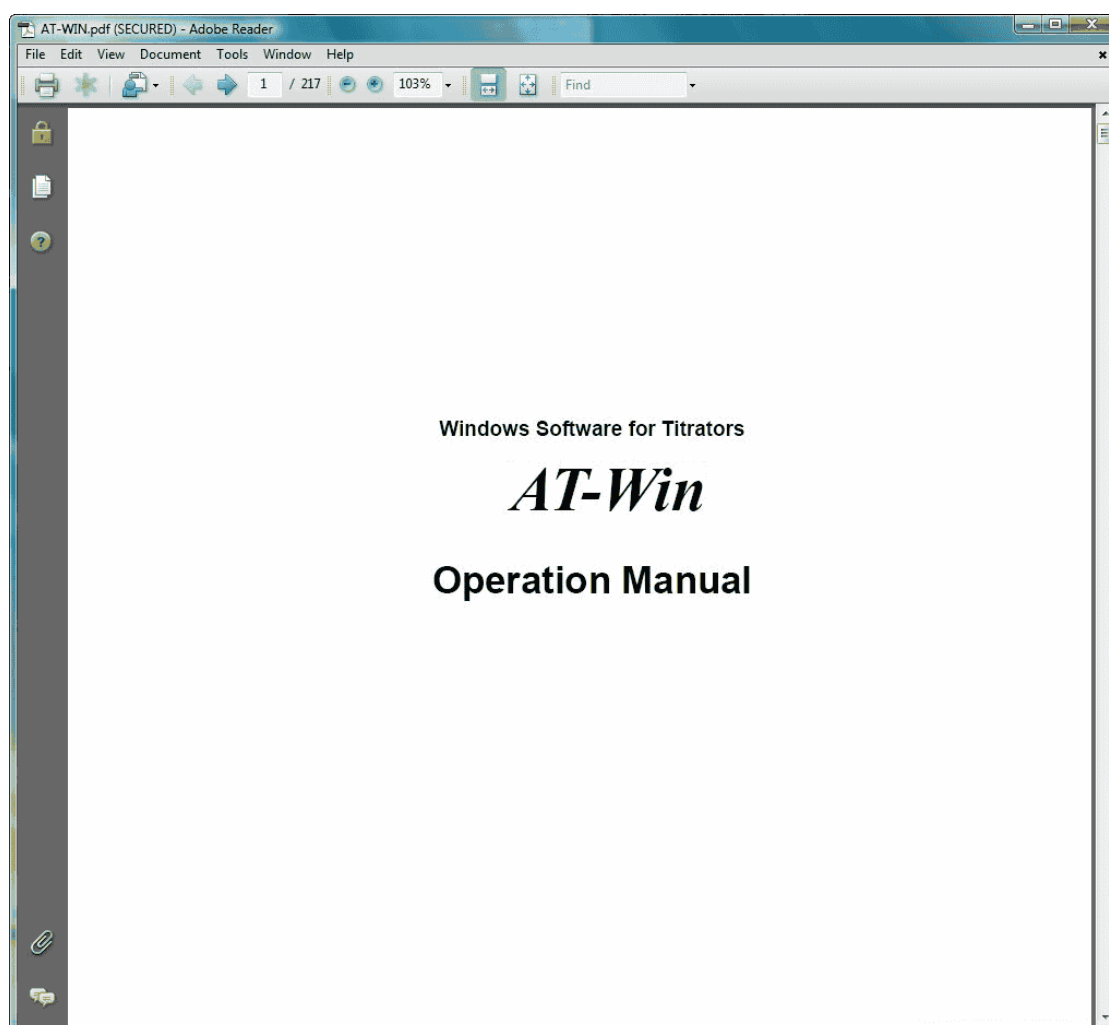
3-4-7-1. [Manual] command

This command shows you the instruction manual in PDF file.

Note:

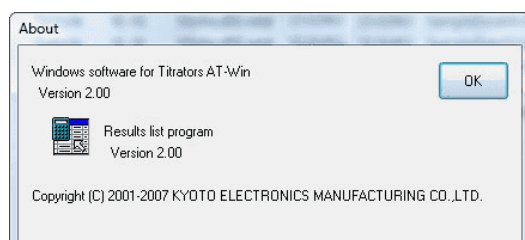
Adobe Reader is necessary to view the manual.

Adobe Reader is the registered trade name of Adobe Systems Incorporated.

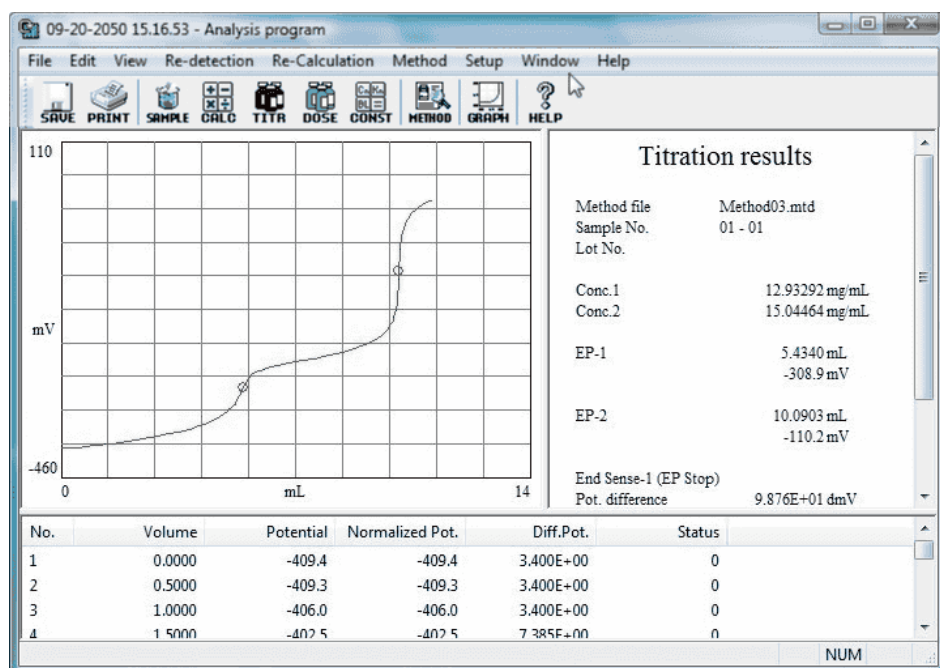


3-4-7-2. [About] command

It shows the version number of the software and copyright of the program.



3-5. Analysis program



[File] menu

- Save : Titration data is saved
- CSV format : Titration data is saved in CSV format
- Word report : Make report on titration data in Microsoft Word
- Print Layout : Select printed items of titration data
- Print : Print titration data
- Print preview : Preview the image of printout
- Printer setup : Select printer and its connection
- Exit : Close the analysis program

[Edit] menu

- Copy titration curve : Copy displayed graph to clip board

[View] menu

- Toolbar : Select to view toolbar and change icon size
- Statusbar : Select to view status bar
- Group 1,2,3,4,5 : Show titration data group of combined method

[Re-detection] menu

- Auto EP : Re-detect EP resulted by Auto EP detection
- Manual EP : Re-detect EP resulted by Auto EP detection or Level Stop
- Auto Intersect : Re-detect EP resulted by Intersect
- Manual Intersect : Re-detect EP resulted by Intersect
- Limited Intersect : Re-detect EP resulted by 2 lines crossing point
- Limited EP : Re-detect EP on a point on titration data

[Re-calculation] menu

- Sample : Change sample parameters
- Formula : Change calculation formula
- Titration unit file : Change contents of unit file used in titration
- Dose unit file : Change contents of unit file used in fixed dose
- Constant list : Change constant used in calculation formula
- All constants list : Change constants
- Number of digits after decimal : Change the number of digits after decimal point of sample size, constant or titration volume

[Method] menu

- View Method : View method used in titration

[Setup] menu

- Titration curve : Change settings of titration curve
- Option : Setting folder for Method file, sample file, data file

[Window] menu

- Cascade : Presently displayed AT-Win programs are superimposed in
- original size
- Arrange All : Presently displayed AT-Win programs are shown in parallel
- Minimize All : Presently displayed AT-Win programs are shown in the smallest size
- Restore All : The minimized AT-Win program displays are enlarged back to
- original size

[Help] menu

- Manual : Shows operation manual
- About : Shows information on application software

3-5-1. [File] menu

3-5-1-1. [Save] command

Titration data is saved.

Short cut

Toolbar



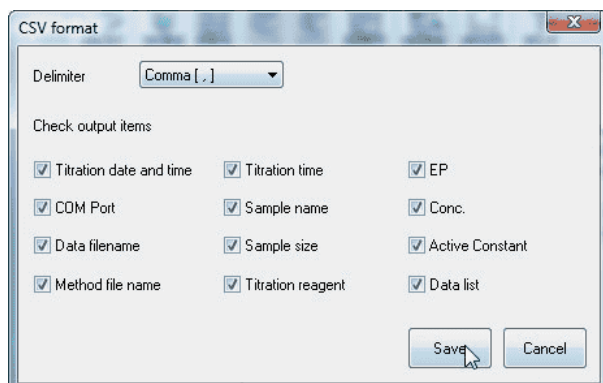
At this time, the [Comment setup] dialog box will appear, please input the reason for updating and the like.

Note:

Please be sure to input comments. The data cannot be saved without inputting comments.

3-5-1-2. [CSV format] command

Titration data is saved in CSV format. When this command is clicked on, [CSV format] dialog box appears.



[Delimiter]

Select a breakpoint character for data in CSV format.

[Check output items]

Check the items you want to save.

Note:

The filename for data in CSV format is automatically named with the same as for titration data filename. The data in CSV format are saved in the folder for CSV file defined on [Option] setup.

3-5-1-3. [Word report] command

Currently active titration data can be made into a report in Microsoft Word.

Template for report can be customized at will.

Note:

To execute this command, Microsoft Word 98/2000/2002/2003/2007 must be pre-installed. This function makes use of Macro which is standard equipped in Word. Set Macro security level to Medium or Low. It does not work at High.

Note:

Symbols used for letters describing reagent name, sample name, Lot number or remarks may not be converted correctly.

Report in customized format

Documenting report in Word is made of Microsoft Word template and macro functions. By customizing template, report can be made in user's own format.

Follow the below steps

1. Copy the report template file attached to AT-Win.
2. Customize the copied template in Microsoft Word. To open the file, keep pressing SHIFT key.
3. Correct the template file to your own format style.
4. Save the template file and close Microsoft Word.
5. Activate the data processing program, and make sure previously edited file works in normal condition.

In case it does not work.....

- Check the keyword if it is correct.
- Make sure Macro is correctly registered.

* For details of Macro, refer to the manual for Microsoft Word.

<Macro keyword list>

Keyword	Description
-AT4Graph-	Graph
-AT4SmpName-	Sample name
-AT4LotNo-	Lot number
-AT4UserName-	Operator's name
-AT4Etc-	Remark
-AT4Size-	Sample size
-AT4SizeUnit-	Sampling unit
-AT4MethodName-	Method file name
-AT4ReagentName-	Reagent name
-AT4TitrUnitFileName-	Unit file name
-AT4BuretNo-	Burette number
-AT4Preamp-	Preamplifier
-AT4DetectNo-	Detector number
-AT4DetectMode-	Detection unit
-AT4TitrMode-	Titration mode
-AT4TitrForm-	Titration form
-AT4DataName-	Data filename
-AT41stLev-	Initial potential level
-AT41stLevUnit-	Initial potential unit
-AT41stTemp-	Initial temperature
-AT41stTempUnit-	Initial temperature unit
-AT4FinLev-	Final potential level
-AT4FinLevUnit-	Final potential level
-AT4FinVol-	Final titration volume
-AT4TitrTime-	Final titration time
-AT4MName-	Titration type or model
-AT4MNo-	Unit number (COM port No.)
-AT4SNo-	Serial No.
-AT4TDate-	Titration date
-AT4TStart-	Titration start hour
-AT4LevUnit-	Actual potential unit
-AT4SmpNo-	Sample number
-AT4E1No-	Endpoint No. (1)
-AT4E2No-	Endpoint No. (2)
-AT4E3No-	Endpoint No. (3)
-AT4E4No-	Endpoint No. (4)
-AT4E5No-	Endpoint No. (5)

Keyword	Description
-AT4E1Vol-	Endpoint titration volume (1)
-AT4E2Vol-	Endpoint titration volume (2)
-AT4E3Vol-	Endpoint titration volume (3)
-AT4E4Vol-	Endpoint titration volume (4)
-AT4E5Vol-	Endpoint titration volume (5)
-AT4E1Lev-	EP potential (1)
-AT4E2Lev-	EP potential (2)
-AT4E3Lev-	EP potential (3)
-AT4E4Lev-	EP potential (4)
-AT4E5Lev-	EP potential (5)
-AT4E1Etc-	EP information (1)
-AT4E2Etc-	EP information (2)
-AT4E3Etc-	EP information (3)
-AT4E4Etc-	EP information (4)
-AT4E5Etc-	EP information (5)
-AT4C1No-	Formula No. (1)
-AT4C2No-	Formula No. (2)
-AT4C3No-	Formula No. (3)
-AT4C4No-	Formula No. (4)
-AT4C5No-	Formula No. (5)
-AT4C1Form-	Formula (1)
-AT4C2Form-	Formula (2)
-AT4C3Form-	Formula (3)
-AT4C4Form-	Formula (4)
-AT4C5Form-	Formula (5)
-AT4C1Ans-	Calculation results (1)
-AT4C2Ans-	Calculation results (2)
-AT4C3Ans-	Calculation results (3)
-AT4C4Ans-	Calculation results (4)
-AT4C5Ans-	Calculation results (5)
-AT4C1Unit-	Unit (1)
-AT4C2Unit -	Unit (2)
-AT4C3Unit -	Unit (3)
-AT4C4Unit -	Unit (4)
-AT4C5Unit-	Unit (5)

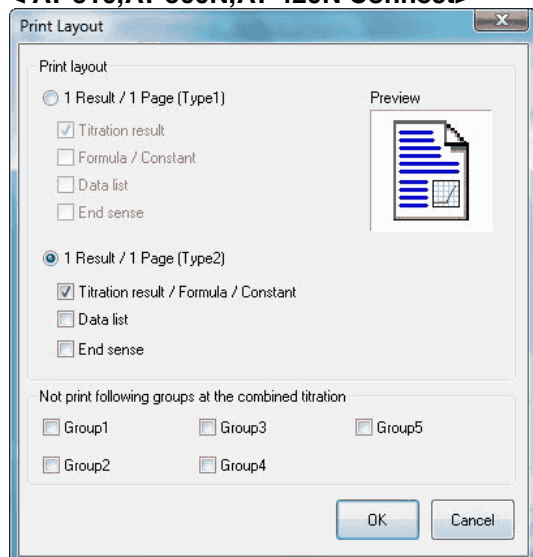
Note:

-AT4Graph- : 1 file must have at least one setting.

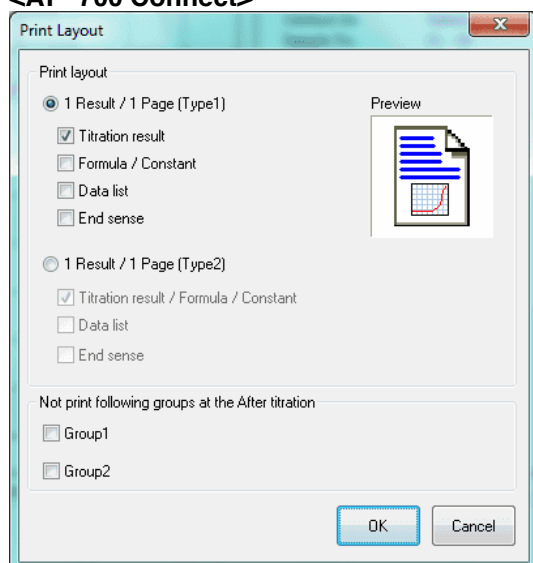
3-5-1-4. [Print Layout] command

Set up printed items and format. When this command is executed, [Print Layout] dialog box appears.

< AT-510,AT-500N,AT-420N Connect>



<AT-700 Connect>



[1 Result / 1 page (Type1)]

One resulting data is printed out on a sheet of paper.

- | | |
|--------------------|--|
| Titration results | : If this item is checked, the printed titration data include the results. |
| Formula / Constant | : If this item is checked, the printed titration data include calculation formula and constant list. |
| Data list | : If this item is checked, the printed titration data include the data list. |
| EP sense level | : If this item is checked, the printed titration data include EP sense level. |

[1 Result / 1 page (Type2)]

One resulting data is printed out on a sheet of paper.

Titration results / Formula / Constant : If this item is checked, the printed titration data include the results, calculation formula and constant list.

Data list : If this item is checked, the printed titration data include the data list.

EP sense level : If this item is checked, the printed titration data include EP sense level.

< Not print following groups at the combined titration >

[Groups 1, 2, 3, 4, 5]

When this box is checked, the groups checked are not printed out at the combined titration.

Note:

“Not print following groups at the combined titration” is not shown on the titration programme where AT-700 is connected.

< Not print following groups at the after titration >

[Groups 1, 2,]

When this box is checked, the groups checked are not printed out at the after titration.

Note:

“Not print following groups at the after titration” is not shown on the titration programme where AT-510, AT-500N or AT-420N is connected.

Note:

For details of Example of printed results, refer to References.

3-5-1-5. [Print] command

Titration results are printed here. The dialog box appears to set up the pages and the number of copies to print out or select an optional printer.

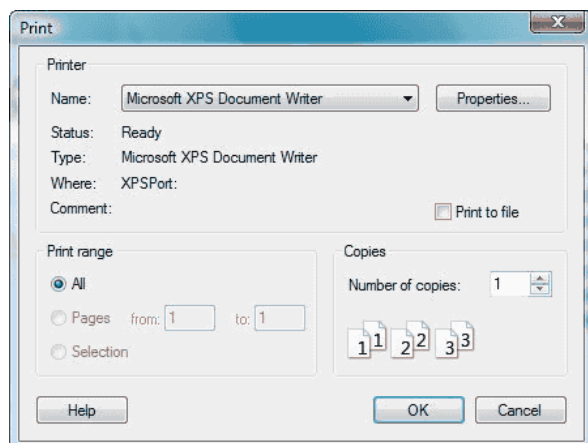
Various selections for printing can be set up here.

Short cut

Toolbar



Keyboard [Ctrl] + [P]



[Printer]

Currently connected printer and its port are shown here. To change the printer, select from [Name] box.

[Print range]

Select the pages you want to print out.

All : Print out all pages

Pages : Enter page number in two boxes

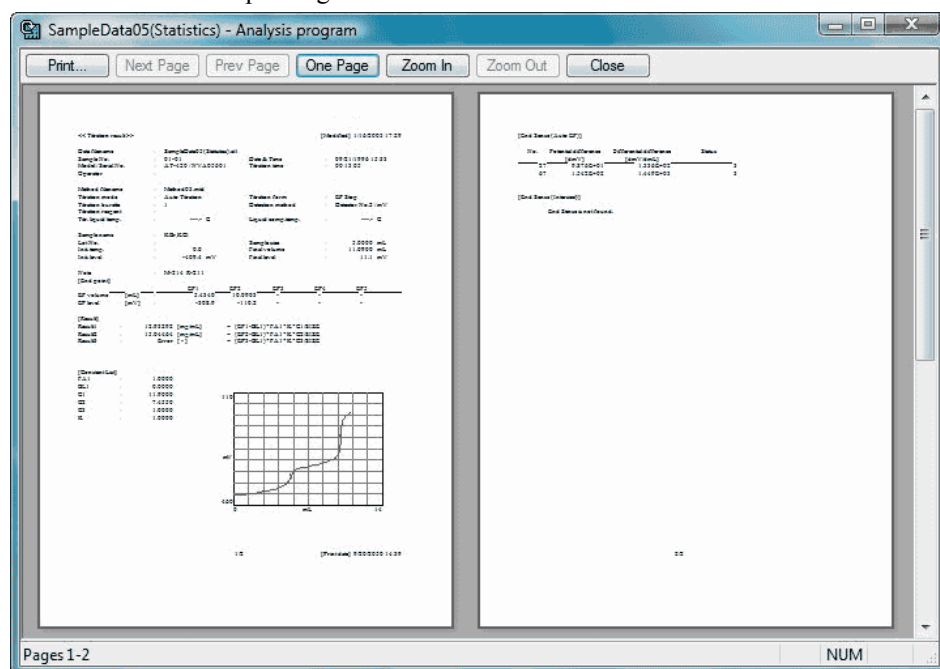
Selection : Not applicable

Note:

[Print] dialog box may differ according to your Windows or printer.

3-5-1-6. [Print preview] command

The printed image of titration data in process appears by executing this command. The display is replaced by preview image, showing 1 or 2 pages. The toolbar on top of the screen can change the displayed page, zoom in or out the screen or start printing.



Print preview toolbar

Print preview toolbar can do the following settings.

[Print]

Shows [Print] dialog box and start printing.

[Next Page]

Previews next page.

[\[Prev Page\]](#)

Previews previous page.

[... Page]

Changes the number of pages to preview.

[Zoom in]

Enlarges the shown display.

[Zoom out]

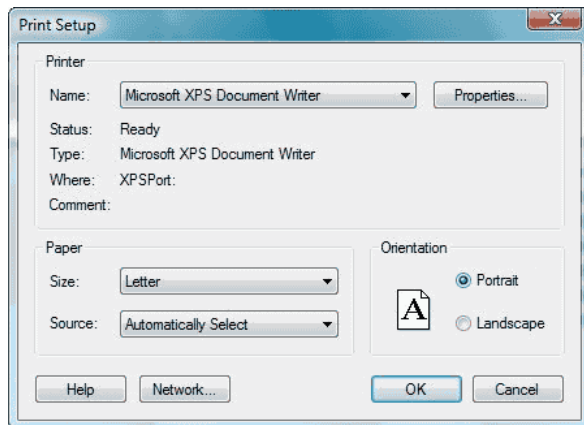
Shrinks the shown display.

[Close]

Closes preview command and returns to Main window.

3-5-1-7. [Printer Setup] command

Here you set up printer selection and connections.



[Printer Name]

If more than one printer are connected, you can select one from the dropdown list box. To install a new printer and/or set up a printer port, use Control panel referring to the manual of Windows system.

[Orientation]

Set print sheet direction to Portrait.

[Paper Size]

Select A4 or Letter.

[Paper source]

If there are more than one tray, select one.

Note:

[Printer Setup] dialog box may differ according to your Windows or printer.

3-5-1-8. [Exit] command

This command finishes the analysis program.

Short cut

Keyboard [Alt] + [F4]

3-5-2. [Edit] menu

3-5-2-1. [Copy titration curve] command

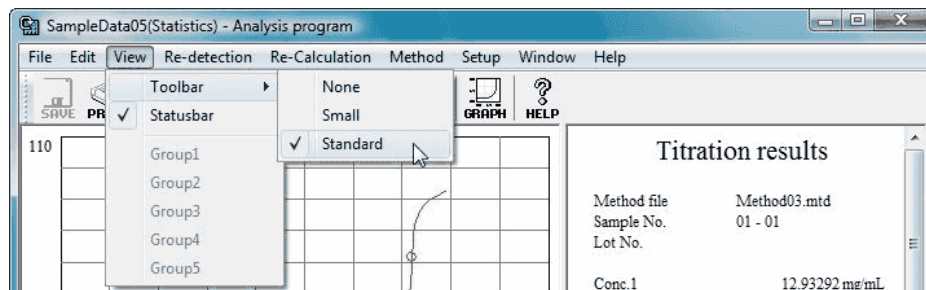
Currently displayed graph is copied to clip board.

The data previously copied to clip board is replaced with new one.











3-5-3. [View] menu

3-5-3-1. [Toolbar] command

The toolbar contains many buttons of the same function like [Save], which is also frequently used in Analysis Program. When a command is active, a checkmark appears on its side.



<Tool button>

Tool button	Function
	Titration data is saved. This is similar to [Save] button in [File] menu.
	Executes printing just like [Print] command in [File] command.
	Changes sample conditions in the same way as [Sample] command in [Re-Calculation] menu.
	Changes calculation formula, the same function as [Formula] command in [Re-Calculation] menu.
	Changes unit file used in titration, which is the same function as [titration unit file] command in [Re-Calculation] menu.
	Changes the unit file used in fixed dose. The same as [Dose unit file] in [Re-Calculation] menu.
	Changes constant for calculation. It works in the same way as [Active Constants List] in [Re-calculation] menu.
	Refers to the Method used in titration. The same function as [View Method] in [Method] menu.
	Changes the display of titration curve. The same function as [Titration curve] command in [Setup] menu.
	Shows operation manual works just like [Manual] command in [Help] menu.

3-5-3-2. [Statusbar] command

Display of Status bar is selected here.

The right side of status bar displays simple description of its function when Menu command is selected. Likewise, when toolbar button is pressed on, simple description appears. To execute the command after reviewed, move the mouse pointer away from the button and release mouse button.

On the right side of status bar, the following ON/OFF status appears.

Display	Description
CAP	[Caps Lock] key is ON.
NUM	[Num Lock] key is ON.
SCRL	[Scroll Lock] key is ON.

While Status bar is shown, checkmark appears on the side of its command.

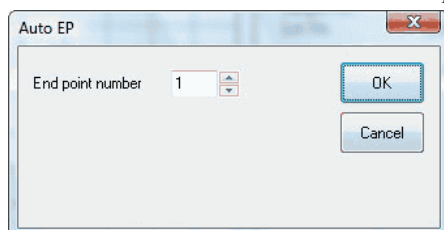
3-5-3-3. [Group 1,2,3,4,5] command

The titration data of selected group is shown here. This command shows only the groups titrated in combined method or in after titration. While titrating, the group of on-going titration is shown, and the group cannot be changed. The currently shown group name appears with checkmark on side.

3-5-4. [Re-detection] menu

3-5-4-1. [Auto EP] command

The endpoint of a titration data is re-detected. This command works when Auto EP (EP Stop) or Full Stop (Full) is selected. The analysis program opens [Auto EP] dialog box. The EP re-detection is useful when the inflection on titration curve is too small to find an endpoint.



Based on a number of endpoints, the endpoints are detected by calculating EP value automatically.

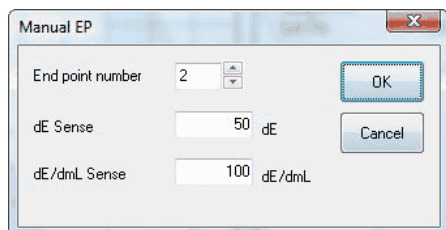
[End point number]

Enter a number of endpoints for re-detection.

3-5-4-2. [Manual EP] command

The endpoint on the active titration data is re-detected here. This can be performed when titration form is either Auto EP Stop (EP Stop) or Full titration (Full) or EP level Stop (Level Stop). The data processing program opens [Manual EP] dialog box. EP re-detection is useful when inflection points on titration curve are too small to find a EP.

< Manual EP when titration form is Auto EP Stop or Full titration >



The dialog box titled "Manual EP" contains three input fields: "End point number" with a value of 2, "dE Sense" with a value of 50 dE, and "dE/dmL Sense" with a value of 100 dE/dmL. There are "OK" and "Cancel" buttons on the right side.

Endpoint is detected from the entered number of EP and its level.

[End point number]

Enter a total number of endpoints for re-detection.

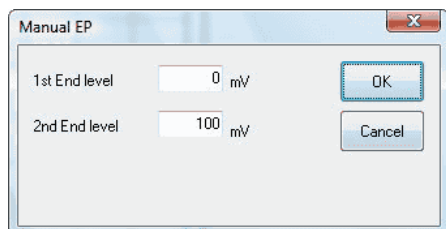
[dE Sense]

Enter sensing level (potential difference) to determine EP. The default is the value preset on Method parameter.

[dE/dmL Sense]

Enter sensing level (differential difference). The default is the value preset on Method parameter.

< Manual EP when titration form is EP Level Stop >



The dialog box titled "Manual EP" contains two input fields: "1st End level" with a value of 0 mV and "2nd End level" with a value of 100 mV. There are "OK" and "Cancel" buttons on the right side.

Determine EP from the entered potential level.

[1st End level]

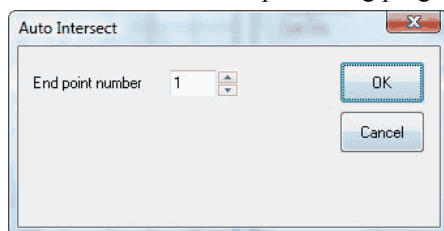
Enter the first EP potential. The default is the value preset on Method parameter.

[2nd End level]

Enter the second EP potential. The default is the value preset on Method parameter.

3-5-4-3. [Auto intersect] command

The endpoint on the active titration data is re-detected here. This can be performed when titration form is Auto Intersect EP. The data processing program opens [Auto Intersect] dialog box.



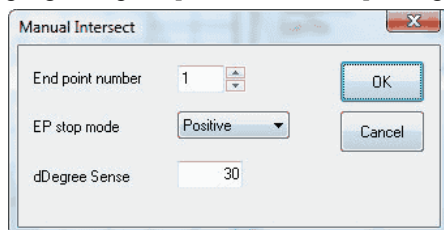
Endpoint is detected automatically from the entered number of EP.

[End point number]

Enter a total number of endpoints for re-detection.

3-5-4-4. [Manual Intersect] command

The endpoint on the active titration data is re-detected here. This can be performed when titration form is either Auto EP Stop (EP Stop) or Full titration (Full) or EP level Stop (Level Stop) or Auto Intersect. The data processing program opens [Manual Intersect] dialog box.



[End point number]

Enter a total number of endpoints for re-detection.

[EP stop mode]

Select EP sensing mode. The default is the value present on Method parameter. There are 3 modes as follows.

- Normal direction
- Reverse direction
- Both directions

[dDegree Sense]

Enter the angle to determine EP. The default is the value present on Method parameter.

3-5-4-5. [Limited Intersect] command

The endpoint on the active titration data is re-detected here. This can be performed when titration form is either Auto EP Stop (EP Stop) or Full titration (Full) or EP level Stop (Level Stop) or Auto Intersect. The data processing program opens [Limited Intersect] dialog box.

Draw 2 lines from 4 selected points, and determine the intersection point.

tangent 1		
Data No.	Volume [mL]	Potential [mV]
6	2.445	-394.8
13	4.48	-365.4

tangent 2		
Data No.	Volume [mL]	Potential [mV]
27	5.415	-312.6
38	6.805	-266.4

[Change EP position]

Select EP position for the limited intersect method. If there is already an endpoint determined by Limited intersect, its position is added. If you want to add EP, you can choose from EP1, EP2 and EP3, and the EP you have selected will be changed to a new EP. Up to 3 points can be determined.

[Data No.]

Input data list number of 2 tangent lines. If a same data list number is entered, Manual Intersect EP does not work.

In case of single tangent line, if a larger value than 2 points of 2 tangent lines is input, Limited EP detection does not work. Make sure to input smaller value.

In case of 2 tangent lines, if a smaller value than 2 points of single line is input, Limited Intersect EP detection does not work. Make sure to input larger value.

[Volume]

The titration volume of entered data list number is shown.

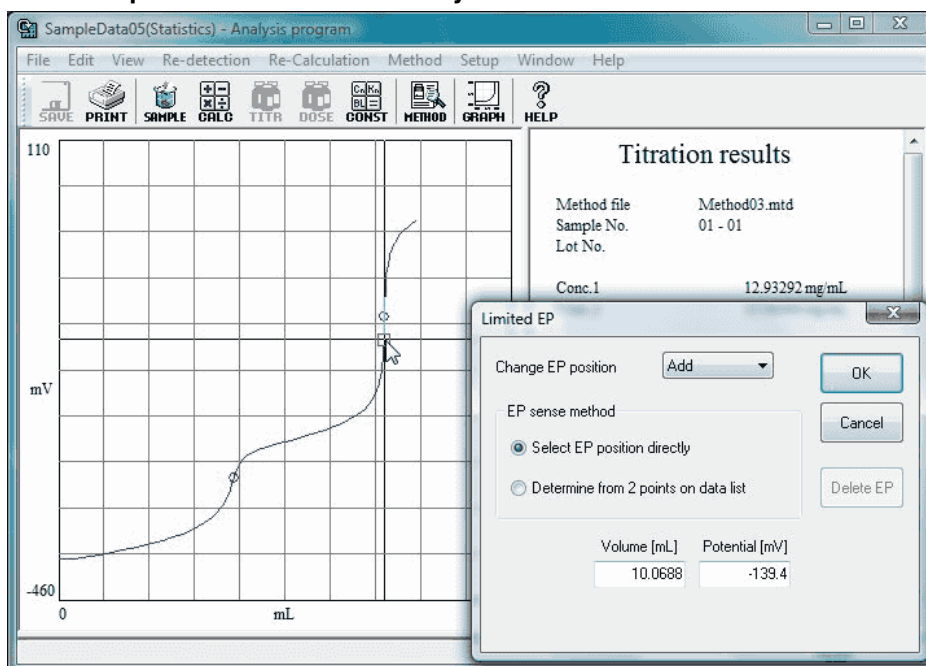
[Potential]

It shows the potential of entered data number.

3-5-4-6. [Limited EP] command

The endpoint on the active titration data is re-detected here. This works when titration form is Auto EP Stop (EP Stop) or Full titration (Full) or EP level Stop (Level Stop) or Auto Intersect. The data processing program opens [Limited EP] dialog box.

< When EP position is defined directly >



Enter titration volume or potential directly and define EP position or you can select EP position maneuvering the mouse on the graph.

[Change EP position]

Select EP position for the limited EP method. If [Add] is chosen a new EP is going to be detected, and if any of EP1, EP2, EP3, EP4 or EP5 is chosen, the selected EP is changed.

[Volume]

Enter titration volume. Then, the potential is calculated in response to the entered data, and will be shown on display after a while.

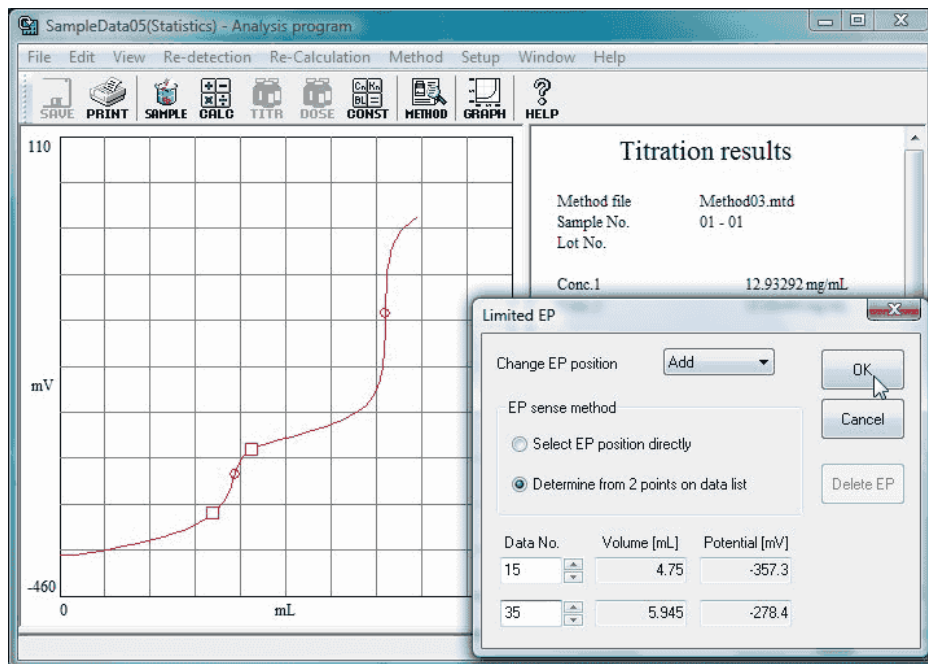
[Potential]

Enter potential. Then, the titration volume is calculated in response to the entered data, and will be shown on display after a while.

[Delete EP]

The endpoint at the selected position is deleted here. If [Add] is chosen, this cannot be deleted.

< When EP is determined from 2 points on data list >



Enter 2 points on data list and determine EP with the range.

[Change EP position]

Select EP position for the limited EP method. If [Add] is chosen a new EP is going to be detected, and if any of EP1, EP2, EP3, EP4 or EP5 is chosen, the selected EP is changed.

[Data No.]

Enter the data list number of 2 points to determine EP. If the same data number is entered, Limited EP method does not work. You must enter a different data list number.

[Volume]

The titration volume of entered data list number is shown on display.

[Potential]

The potential of entered data list number is shown on display.

[Delete EP]


The endpoint at the selected position is deleted here. If [Add] is chosen, this cannot does not work.

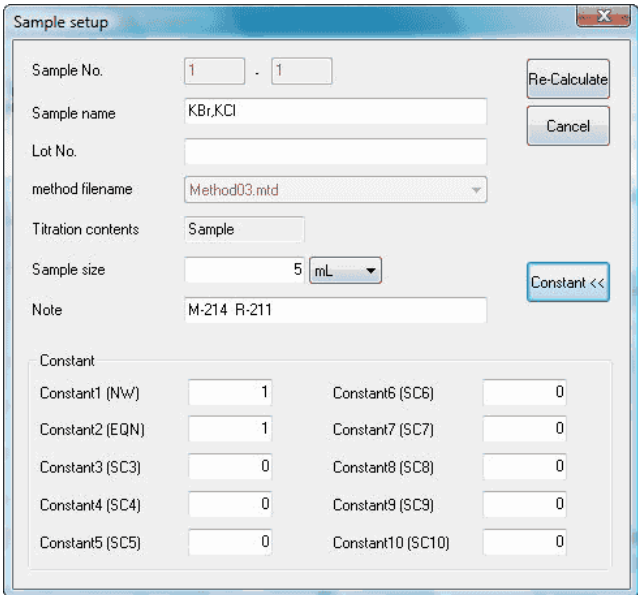
3-5-5. [Re-Calculation] menu

3-5-5-1. [Sample] command

[Sample] command changes sampler parameters. Click on [Sample setup] dialog box to open it.

Short cut

Toolbar : 



The 'Sample setup' dialog box contains the following fields and controls:

- Sample No.:** Two input boxes with values '1' and '1'.
- Sample name:** Text box containing 'KBr,KCl'.
- Lot No.:** Empty text box.
- method filename:** Dropdown menu showing 'Method03.mtd'.
- Titration contents:** Text box containing 'Sample'.
- Sample size:** Text box with '5' and a unit dropdown menu showing 'mL'.
- Note:** Text box containing 'M-214 R-211'.
- Buttons:** 'Re-Calculate', 'Cancel', and 'Constant <<'.
- Constant section:** A table of 10 constants (Constant1 to Constant10) with their respective values.

Constant	
Constant1 (NW)	1
Constant2 (EQN)	1
Constant3 (SC3)	0
Constant4 (SC4)	0
Constant5 (SC5)	0
Constant6 (SC6)	0
Constant7 (SC7)	0
Constant8 (SC8)	0
Constant9 (SC9)	0
Constant10 (SC10)	0

[Sample No.]

It shows sample numbers.

[Sample name]

Changes sample name.

[Lot No.]

Changes lot numbers.

[Method filename]

Shows the method filename used in titration.

[Titration contents]

Details of titration configured by the calculation formula on selected Method file.

[Sample size]

Change sample size and unit.

[Constant>>], [Constant <<] button

Select to view or not to view the constants.

[Constant]

Change the constant relative to the sample. The value entered here can be used in calculation.

3-5-5-2. [Formula] command

Calculation formula is changed here. Click on this command to show [Formula] dialog box. If any of the details is changed and [Re-Calculate] button is clicked on, the recalculation is executed.

Short cut

Toolbar



Formula

Titration contents: Sample EP Priority: EP

	Conc.	Formula	Unit
<input checked="" type="checkbox"/> Formula 1	C01	= (EP1-BL1)*FA1*K*C1/SIZE	mg/mL
<input checked="" type="checkbox"/> Formula 2	C02	= (EP2-BL1)*FA1*K*C2/SIZE	mg/mL
<input type="checkbox"/> Formula 3	C03	= (EP3-BL1)*FA1*K*C3/SIZE	
<input type="checkbox"/> Formula 4	C01	=	
<input type="checkbox"/> Formula 5	C01	=	

	EP position	Decimal	Rounding method	Evaluation	Target value	Criterion
Formula 1	EP1	5	Round up	Off	0 +/-	0
Formula 2	EP2	5	Round up	Off	0 +/-	0
Formula 3	EP3	5	Round up	Off	0 +/-	0
Formula 4	None	5	Rounded	Off	0 +/-	0
Formula 5	None	5	Rounded	Off	0 +/-	0

Active Constant All Constant Liquid comp.

Re-Calculate Close Print

Note:

For [Formula] dialog box, refer to [3.6.3.Calculation parameter].

3-5-5-3. [Titration unit file] command

You can change unit files for titration used in this titration data. Click on this command to show [Edit unit file] dialog box. Change any parameter you want and click on [Re-calculate] button to execute recalculation.

Short cut

Toolbar

A screenshot of the "Edit Unit File" dialog box. It contains fields for Unit filename (HCL_0.05M.utf), Reagent name (0.05mol/L Hydrochloric acid), Factor (1), Remaining reagent (1000 mL), Temp. comp. coefficient A (1), and Temp. comp. coefficient B (0). There is an "Alarm setting" section with checkboxes for "Lowest volume of reagent", "Next reagent replacement day", "Next piston replacement day", and "Next capacity validation day", each with a date selector and an "Update" button. There is also an "Auto update interval" section with a "7 Day" selector. A "Constant" section at the bottom has two radio buttons: "Titration unit constant" (selected) and "Dose Unit constant". Below these are ten constant fields (Constant1 to Constant10) all set to 0. On the right side of the dialog are buttons for "Re-Calculate", "Cancel", "Print", and "Constant <<".

[Unit filename]

Shows unit filenames.

[Reagent name]

Change reagent names.

[Factor]

Change factor value.

[Remaining reagent]

Shows the remaining reagent volume at time of measurement.

[Next reagent replacement day]

Shows the next reagent replacement day at time of measurement.

[Next piston replacement day]

Shows the next piston replacement day at time of measurement.

[Next capacity validation day]

Shows the next burette capacity validation day at time of measurement.

[Temp. comp. coefficient A]

Change the temperature compensation coefficient A. The temperature compensation of titration solution here means volumetric correction at the temperature of titration solution.

[Temp. comp. coefficient B]

Change the temperature compensation coefficient B.

Usually titration is performed at the temperature close to the degree when calibrated, however, if the difference is large than $\pm 3^{\circ}\text{C}$, its volume needs to be corrected

<Liquid compensation formula>

$$V = V_0 \cdot (1 + A \cdot \Delta T \cdot 10^{-3} + B \cdot \Delta T^2 \cdot 10^{-6})$$

V : compensated titration volume

V_0 : titration volume

ΔT : (Compensated temperature - Liquid temperature)

[Constant >>], [Constant <<] button

Select to show the constant or not.

[Constant]

Changes the constant relative to the sample.

3-5-5-4. [Dose unit file] command

Here you can change the unit file for fixed dose used in titration for this data. Click on the command to show [Edit unit file] dialog box. Enter any changes, and click on [Re-calculate] button.

Short cut

Tool button :



Unit filename: HCl_0.05M.utf

Reagent name: 0.05mol/L Hydrochloric acid

Factor: 1

Remaining reagent: 1000 mL

Temp. comp. coefficient A: 1

Temp. comp. coefficient B: 0

Alarm setting

☐ Lowest volume of reagent less than 50 mL

☐ Next reagent replacement day 1/10/2002 Update 7 Day

☐ Next piston replacement day 1/10/2002 Update 7 Day

☐ Next capacity validation day 1/10/2002 Update 7 Day

Auto update interval: 7 Day

Constant

☐ Titration unit constant ☒ Dose Unit constant

Constant1 (DMW): 0

Constant2 (DEQN): 0

Constant3 (DC3): 0

Constant4 (DC4): 0

Constant5 (DC5): 0

Constant6 (DC6): 0

Constant7 (DC7): 0

Constant8 (DC8): 0

Constant9 (DC9): 0

Constant10 (DC10): 0

Buttons: Re-Calculate, Cancel, Print, Constant <<

[Unit filename]

Shows the unit filename.

[Reagent name]

Changes reagent name.

[Factor]

Changes reagent factor value.

[Remaining reagent]

Shows the remaining reagent volume at time of measurement.

[Next reagent replacement day]

Shows the next reagent replacement day at time of measurement.

[Next piston replacement day]

Shows the next piston replacement day at time of measurement.

[Next capacity validation day]

Shows the next burette capacity validation day at time of measurement.

[Temp. comp. coefficient A]

Change the temperature compensation coefficient A. The temperature compensation of titration solution here means volumetric correction at the temperature of titration solution.

[Temp. comp. coefficient B]

Change the temperature compensation coefficient B.

Usually titration is performed at the temperature close to the degree when calibrated, however, if the difference is large than $\pm 3^{\circ}\text{C}$, its volume needs to be corrected.

<Liquid compensation formula>

$$V = V_0 \cdot (1 + A \cdot \Delta T \cdot 10^{-3} + B \cdot \Delta T^2 \cdot 10^{-6})$$

V : compensated titration volume

V₀ : titration volume

ΔT : (Compensated temperature - Liquid temperature)

[Constant >>], [Constant <<] button

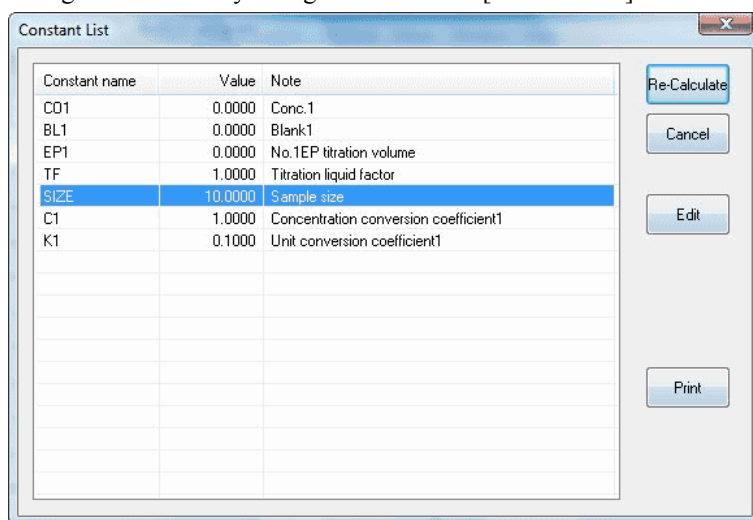
Select to show the constant or not.

[Constant]

Changes the constant relative to the sample.

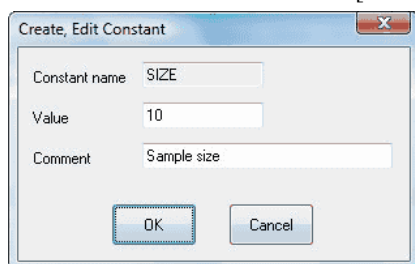
3-5-5-5. [Constant list] command

Changes the constant in formula for Method used in the titration. Click on this command to show [Constant list] dialog box. Give any changes and click on [Re-calculate] button.



[Edit] button

Changes constant (numeric and comment) here. Point the cursor the constant you want to change on the list, and click on this button to show [Create, Edit Constant] dialog box.

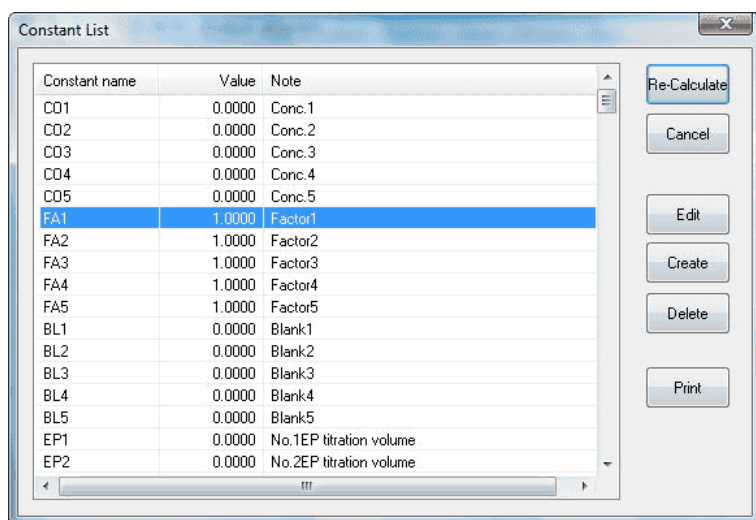


[Print] button

Prints out the constants on the list.

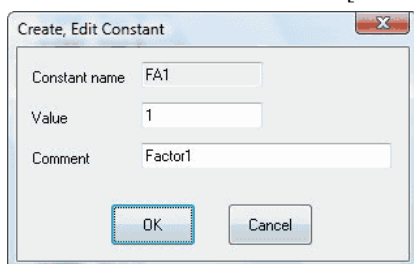
3-5-5-6. [All constant list] command

You can edit here the all of constant list used in AT-Win. Click on this command to show [Constant List] dialog box.



[Edit] button

Make changes (numeric and comment) here. Point the cursor on the constant name on the list to change, and click on this command to show [Create, Edit Constant] dialog box.



[Create] button

Create new constants here. Click on this button to show [Create, Edit Constant] dialog box.

[Delete] button

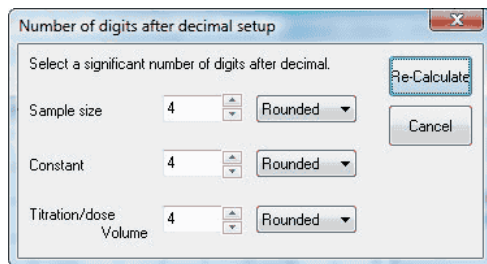
Delete the constant you do not need from the list. Point the cursor on the constant name on the list to erase, and click on [OK] to delete when prompted.

[Print] button

Prints out the constant on the list.

3-5-5-7. [Number of digits after decimal] command

You can change the number of digits after decimal point for sample size, constant or titration / dose volume. Click on this command to show [Number of digits after decimal setup] dialog box.



[Sample size]

Changes the number of digits after decimal point for sample size and settings.

[Constant]

Changes the number of digits after decimal point for constant and settings.

[Titration / dose volume]

Changes the number of digits after decimal point for titration volume / dose volume and settings.

3-5-6. [Method] menu

3-5-6-1. [View method] command

The Method used in titration for the data is shown here. Click on this command to show [View Method] dialog box.

View Method

Titration / Dose Control

Titration parameter

Titration mode: Auto Titration

Titration form: EP Stop

Burette No.: 1

Unit filename: Do not use

Detection method: Detector No.2 / mV

Temp. coefficient: 2 %

Max volume: 20 mL

Wait time: 0 sec

Direction: Auto

EP stop mode: Positive

Dose parameter

Dose mode: Off

Burette No.: 1

Unit filename: Do not use

Detection method: Detector No.1 / mV

Temp. coefficient: 2 %

Volume: 20 mL

Level: 0 mV

Differential: 0 mV/mL

Cut-off time: 0 sec

Unit volume: 0.1 mL

Dispense speed: 50 sec/mL

Wait time: 0 sec

Close Print

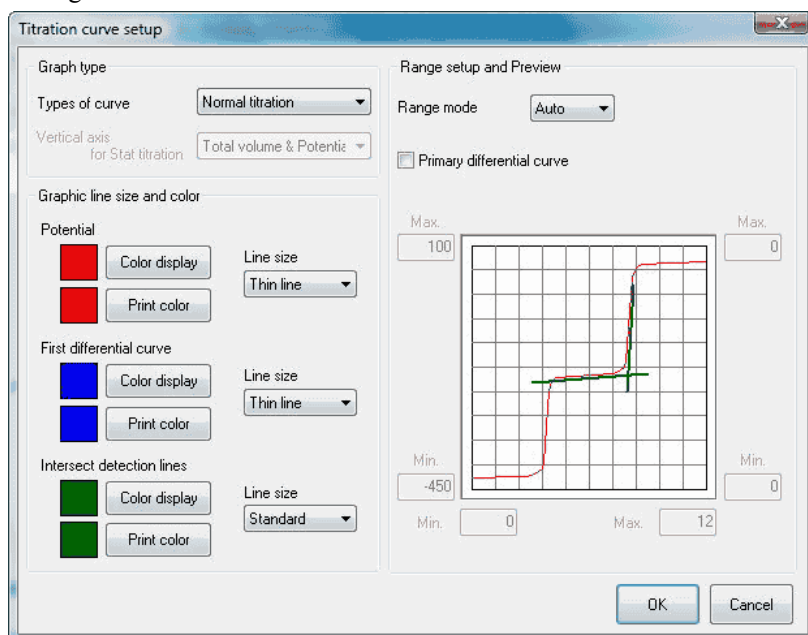
Note:

[View method] shows the Method parameter used in titration, and the parameters cannot be changed here.

3-5-7. [Setup] menu

3-5-7-1. [Titration curve] command

Configure how to show the titration curve here. Click on this command to show [Titration curve setup] dialog box.



[Types of curve]

Select a type of titration curve depending on your needs.

- Normal titration
- Stat titration

[Vertical axis for Stat titration]

Select graphic mode for stat titration. The below parameters appear only when stat titration is selected.

- Total titration volume and actual potential
..... Time is shown on horizontal axis and total titration volume is on vertical.
- Titration volume and actual potential
..... Time is on horizontal axis and actual potential on vertical left, and titration volume on vertical right.
- Titration volume
..... Time is shown on horizontal axis and total titration volume is on vertical.

[Range mode]

Select auto or manual to zoom in or out graphic range.

[Max.]

Enter the maximum value on axis. When the range mode is auto, the value is taken for default. Enter value in second for time axis.

[Min.]

Enter the minimum value on axis. When the range mode is auto, the value is taken for default. Enter value in second for time axis.

[Primary differential curve]

The first differential curve appears when this box is checked. This curve does not appear when stat titration is chosen.

[Color display] button

Select line colors on display.

[Print color] button

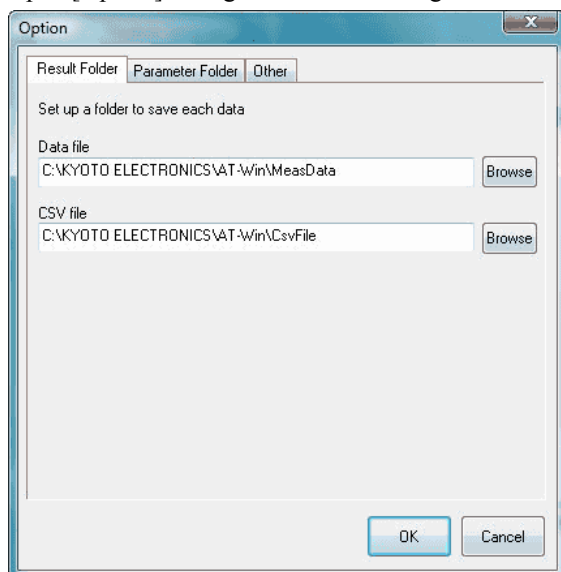
Select graphic color for titration results.

[Line size]

Select line size for titration results graph.

3-5-7-2. [Option] command

Open [Option] dialog box here. Configure the following settings on this box.



[Result folder] tab

- [Data file].....Select a folder to store data file.
- [CSV file].....Select a folder to store data in CSV format.
- [Browse] button[Browse for folder] dialog box appears.

[Parameter folder] tab

- [Method file].....Select a folder to store Method file.
- [Sample file].....Select a folder to store sample file.
- [Unit file]Select a folder to store unit file.
- [Sequence file]Select a folder to store sequence file.
- [pH table file]Select a folder to store pH table file.
- [Browse] button[Browse for folder] dialog box appears.

[Other] tab

Here you make settings in general for AT-Win program. Each item becomes effective when checked.

[Make the background color white]

The background color for titration curve, data list and titration information becomes white. It turns to black when checked out.

[Use operating procedure guide]

The operating guide preset on Method file can be made valid.

[Auto renewal of combined Method file]

When the preset contents in combined normal Method are changed, the changes are automatically made in the combined Method.

[Make the alarm function active]

Here you can set the alarm for periodic check, periodic calibration, burette precision validation and etc.

[Auto registration of factor value in unit file]

The mean value after a plural number of consecutive measurements is automatically put into the unit file.

3-5-8. [Window] menu

3-5-8-1. [Cascade] command

Presently displayed AT-Win programs are superimposed in original size.

3-5-8-2. [Arrange All] command

Presently displayed AT-Win programs are shown in parallel.

3-5-8-3. [Minimize All] command

Presently displayed AT-Win programs are shown the smallest size.

3-5-8-4. [Restore All] command

The minimized AT-Win program displays are enlarged back to original size.

3-5-9. [Help] menu

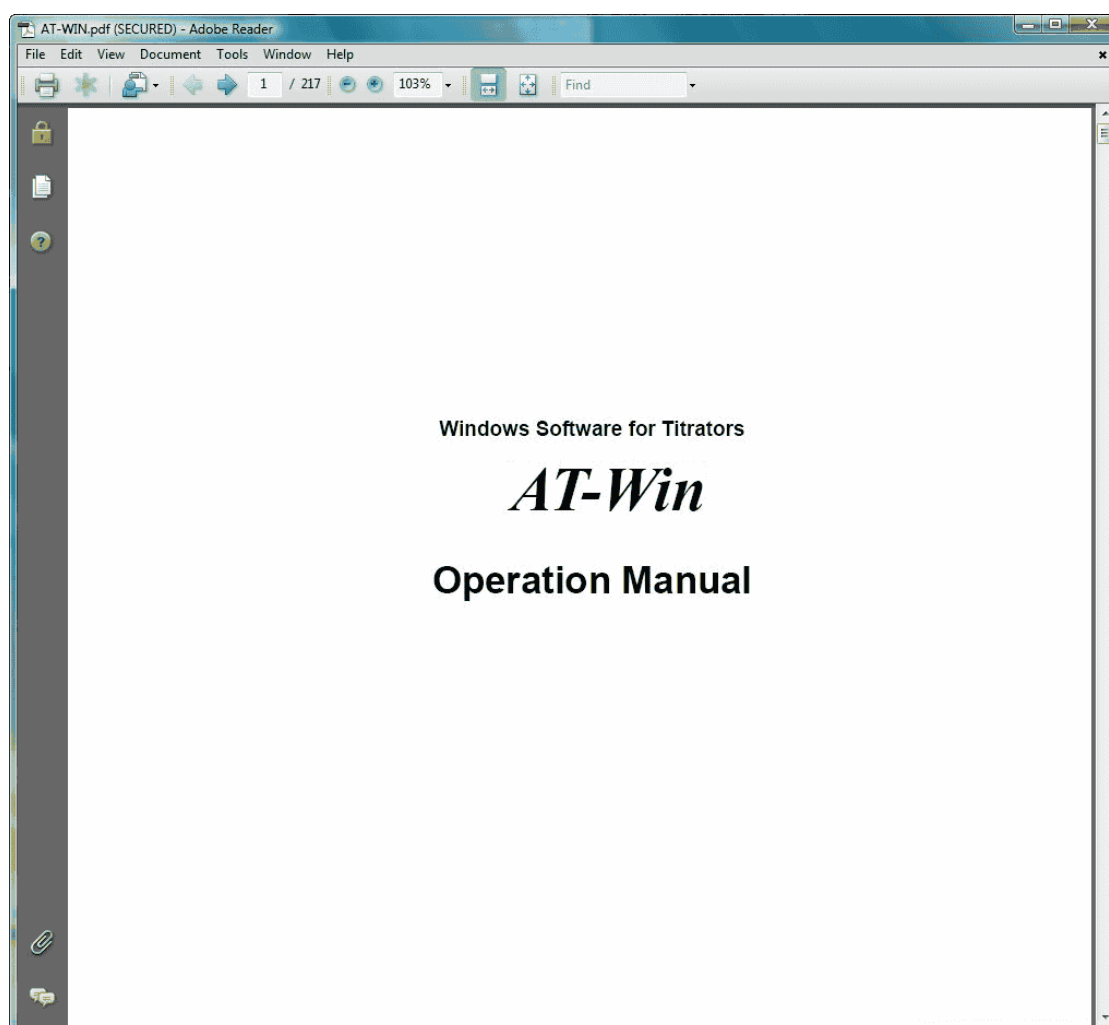
3-5-9-1. [Manual] command

This command shows you the instruction manual in PDF file.

Note:

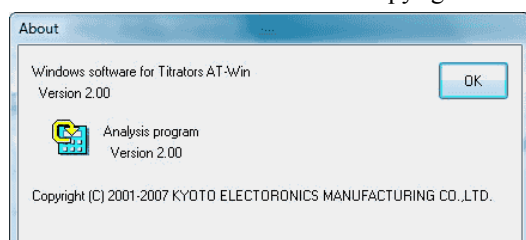
Adobe Reader is necessary to view the manual.

Adobe Reader is the registered trade name of Adobe Systems Incorporated.



3-5-9-2. [About] command

It shows the version number and copyright of titration program.



3-6. About Method File

There are two Methods: Normal method and Combined method. The file, which contains Method is called Method file.

Method file can be made by [Create by Navigation] command or [Create] command from [Method] menu in titration program.

< Normal method >

This is the smallest unit of Method, and filed into one including titration conditions, calculation formula, etc. Usually this Method is used with extension [ms1] where AT-510, AT-500N or AT-420N is connected, and with extension [ms71] where AT-700 is connected.

Method consists of the following parameters

- Titration /Fixed dose parameter
- Control parameter
- Formula parameter
- Operating procedure guide parameter

< Combined method >

The Method with a plural number of Methods connected into a combination, and up to 5 normal methods can be combined for continuous titration one after another. Method file has [mc1] extension.

The combined method cannot be created by [Create by Navigation] from [Method] menu in titration program.

Note:

The combined method cannot be used on the titration programme where AT-700 is connected

< About a file format >

The method files built on AT-420N-WIN, AT-420-WIN, or AT-Win (Ver.1.09 or earlier) cannot be used on AT-Win as they are.

When using them, it is necessary to convert the file format with the attached file conversion program.

The file conversion program is installed in the folder from which the AT-Win software is installed.

model	Step1	Step2
AT-420N-WIN, AT-420-WIN	AT-4xx File conversion (Win4xxConv.exe)	AT-Win File conversion (AT0toAT1.exe)
AT-Win (Ver1.09 or earlier)	—	AT-Win File conversion

Note:

A method file can be converted only to the method file format (ms1) for the titration programme where AT-510, AT-500N or AT-420N is connected.

3-6-1. Titration / Dose parameter

Here you configure parameters for titration and fixed dose.

< AT-510, AT-500N, AT-420N Connect >

Acidity.ms1 - Edit Method File

Titration / Dose Control Formula Operating Procedure Guide

Titration parameter

Titration mode: Auto Titration

Titration form: EP Stop

Burette No.: 1

Unit filename: HCl_0.05M.utf

Detection method: Detector No.1 / mV

Temp. coefficient: 2 %

Max volume: 20 mL

Wait time: 0 sec

Direction: Auto

EP stop mode: Positive

☒ **Dose parameter**

Dose mode: Volume stop

Burette No.: 1

Unit filename: HCl_0.05M.utf

Detection method: Detector No.1 / mV

Temp. coefficient: 2 %

Volume: 20 mL

Level: 0 mV

Differential: 0 mV/mL

Cut-off time: 0 sec

Unit volume: 0.1 mL

Dispense speed: 50 sec/mL

Wait time: 0 sec

Save Close Print

[Dose parameter] check box

The fixed dose parameters become significant when this is checked.

[Titration mode]

Select titration mode out of the following 7 modes.

- Blank Titration
- Auto Titration
- Auto.Intermit
- Intermit
- KF Titration
- COD Titration
- Petroleum Titr
- Petroleum Titr2

[Titration form]

Select titration form the following 5 forms.

- Full titration
- Auto EP Stop
- Level Stop
- Auto Intersection
- Stat titration

[Burette No.]

Enter the burette number for titration or fixed dose.

[Unit filename]

Select reagent unit filename for titration or fixed dose. Measurement can be performed without selecting reagent unit filename. Reagent unit file can be set up by clicking on [Unit file] command from [Method] menu in titration program.

[Detection method]

Select Detector number and its unit for titration or fixed dose. Select the same number for detector as preamplifier port connected to the electrode. As to the unit, select an appropriate unit according to the preamplifier.

- Detector No.1/pH (acid-base titration)
- Detector No.1/mV (acid-base titration, redox or precipitation)
- Detector No.2/mV (redox or precipitation titration)
- Detector No.3/pH (acid-base titration)
- Detector No.3/mV (acid-base titration, redox or precipitation, constant current polarization)
- Detector No.3/u A (constant voltage titration)
- Detector No.3/%T (photometric titration)
- Detector No.3/Abs (photometric titration)
- Detector No.3/100uS (conductivity titration)
- Detector No.3/1000uS (conductivity titration)
- Detector No.3/10000uS (conductivity titration)

[Temp. coefficient]

Select coefficient for temperature compensation for sample in conductivity titration.

[Max volume]

Enter the maximum titration volume.

[Wait time]

Enter the time length before start titration.

[Direction]

Select the direction to find out EP from the following 3 types.

- Auto
- Positive
- Negative

[EP stop mode]

Select EP turning direction from the following 3 ways: (This works only when the titration form is Auto Intersect.)

- Positive
- Negative
- Both

[Dose mode]

Select a fixed dose mode from the following 4 modes.

- No setting (Off)
- Set by volume (Volume Stop)
- Set by potential level (Level Stop)
- Differential setup (Diff Stop)

[Volume]

Enter reagent volume to dose and stop.

[Level]

Enter the potential to end dosing.

[Differential]

Enter the differential level to end dosing.

[Cut-off time]

Enter interval time for cutoff dose. Reagent is dosed at every interval. 0sec means continuous constant speed dosing.

[Unit volume]

Enter the amount of dose at a time during cutoff.

[Dispense speed]

Enter the speed for fixed dose.

[Wait time]

Enter the time length from start titration to start dosing.

[Print] button

Prints out this method parameter.

[Save] button

Saves currently edited contents in [Edit Method file] dialog box and closes the box. At this time, the [Comment setup] dialog box will appear, please input the reason for updating and the like.

Note:

Please be sure to input comments. The data cannot be saved without inputting comments.

[Close] button

It closes the dialog box without saving the contents of the settings for the [Edit Method File] dialog box under edit.

< AT-700 Connect >

Acidity.ms71 - Edit Method File

Titration / Dose Control Formula Pre-Dose Operating Procedure Guide

Titration parameter

Titration Mode: Auto Titration

Titration Form: EP Stop

Blank Mode: OFF

Burette No.: 1

Unit File Name: Do not use

Channel/Unit: Detector No.1 / mV

Max. volume: 20 mL

Wait Time: 0 sec

Direction: Auto

Dose parameter

Dose Mode: Off

Volume: 20 mL

Stop Level: 0 mV

Cut off time: 0 sec

Unit volume: 0.1 mL

Dispense Speed: 50 sec/mL

Wait Time: 0 sec

☐ After Titr

Method: []

Save Close Print

[Titration Mode]

Select titration mode out of the following 4 modes.

- Auto Titration
- Auto.Intermit
- Intermit
- Stat

[Titration Form]

Select titration form the following 4 forms.

- EP Stop
- Level Stop
- Full
- Stat

Note:

Stat can be selected on the titration form only when the titration mode is set to Stat. When Stat is selected on the titration mode, Stat is always selected on the titration form.

[Blank Mode]

Blank mode is used for blank measurement and microdetermination. This mode can be selected when [Titration mode] is [Auto.Intermit].

- OFF Performs normal titration in Auto.Intermit.
- ON Slowly conducts measurement of Auto Int. as Blank Mode, and detects one end point.

[Burette No.]

Enter the burette number for titration and fixed dose.

[Unit filename]

Select reagent unit filename for titration and fixed dose. Measurement can be performed without selecting reagent unit filename. Reagent unit file can be set up by clicking on [Unit file] command from [Method] menu in titration program.

[Channel/Unit]

Select Detector number and its unit for titration or fixed dose. Select the same number for detector as preamplifier port connected to the electrode. As to the unit, select an appropriate unit according to the preamplifier.

- Detector No.1/pH (acid-base titration)
- Detector No.1/mV (acid-base titration, redox or precipitation)
- Detector No.2/mV (redox or precipitation titration)
- Detector No.3/pH (acid-base titration)
- Detector No.3/mV (acid-base titration, redox or precipitation, constant current polarization)
- Detector No.3/u A (constant voltage titration)
- Detector No.3/%T (photometric titration)
- Detector No.3/Abs (photometric titration)
- Detector No.3/100uS (conductivity titration)
- Detector No.3/1000uS (conductivity titration)
- Detector No.3/10000uS (conductivity titration)

[Max volume]

Enter the maximum titration volume.

[Wait Time]

Enter the time length before start titration.

[Direction]

Select the direction to find out EP from the following 3 types.

- Auto
- Positive
- Negative

[After Titr] check box

The fixed after titration become significant when this is checked.

[Method]

Select Method filename to be after titrated.

[Dose mode]

Select a fixed dose mode from the following 3 modes.

- No setting (Off)
- Set by volume (Volume stop)
- Set by potential level (Level stop)

[Volume]

Enter reagent volume to dose and stop.

[Stop Level]

Enter the potential to end dosing.

[Cut off time]

Enter interval time for cutoff dose. Reagent is dosed at every interval. 0sec means continuous constant speed dosing.

[Unit volume]

Enter the amount of dose at a time during cutoff.

[Dispense Speed]

Enter the speed for fixed dose.

[Wait Time]

Enter the time length from start titration to start dosing.

[Print] button

Prints out this method parameter.

[Save] button

Saves currently edited contents in [Edit Method file] dialog box and closes the box. At this time, the [Comment setup] dialog box will appear, please input the reason for updating and the like.

Note:

Please be sure to input comments. The data cannot be saved without inputting comments.

[Close] button

It closes the dialog box without saving the contents of the settings for the [Edit Method File] dialog box under edit.

3-6-1-1. About titration mode

Blank titration

The blank titration mode is designed to conduct blank test or micro titration less than 1mL, and performs auto cutoff titration while sensing potential stability. (The blank test in back titration uses the same titration mode for sample measurement.)

Note:

Select the blank mode where AT-700 is connected.

Auto Titration

This mode controls titration by dosing speed, which changes from faster when potential change is small and slower when potential change becomes larger.

Auto Intermit

This mode is for those samples of which reaction is so slow that it takes time to reach potentially stable condition after dosed. Titration solution is cutoff dosed while sensing potential stability. The dose amount is automatically determined by potential slope.

Intermit

This mode performs cutoff titration at the same speed or continuously at the same speed. Continuous same speed titration can be performed by setting cutoff time to 0 sec for control parameter. Titration speed can be set by dose speed.

The cutoff mode titrates intermittently by dosing at preset intervals, and stat titration is possible only in this mode.

Petroleum Titration

This mode conforms to JIS K 2501 standard method for petroleum products neutralization titration.

Potential stability is determined when potential difference is smaller than preset level during potential reading, and titration solution is discharged while the data are sampled in. If the potential difference before and after dose is larger than preset level, the dose volume is changed from the first preset dose volume to the second volume.

Note:

This mode is not available when AT-700 or AT-500N is connected.

Petroleum Titration2

This mode provides the titration mode for intermittent titration; intermittent quantity of dose volume and Cut-off Time are changed at set pH (mV), and titration is carried on. This measurement enables you to judge potential stability after titrant has been dosed. The titration form can select EP stop or Level stop.

Note:

This mode is not available when AT-700 or AT-500N, AT-420 is connected.

KF Titration

This mode is designed only for moisture titration by Karl Fischer method. The optional connecting kit is necessary for this mode.

Note:

This mode is not available with AT-700 or AT-500N.

COD Titration

This mode is specially designed for the standard test method for industrial waste water required by JIS K 0102 "Consumption of Potassium Permanganate at 100°C" (COD).

Note:

This mode is not available with AT-700 or AT-500N.

Stat

This is the titration mode for stat titration.

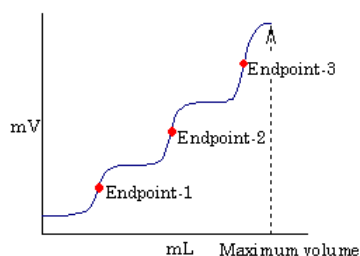
Note:

This mode is available only with AT-700.

3-6-1-2. About titration form

Full

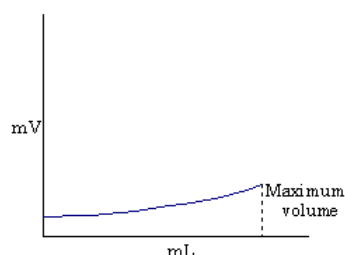
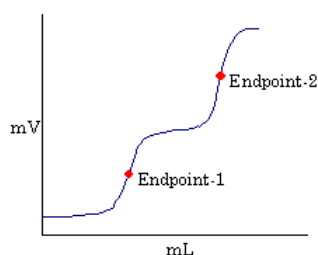
This form continues titration up to the maximum volume present for titration parameter until it ends. The endpoint is detected automatically. The number of detectable EP depends on the connected titrator. When AT-700/AT-510 is connected, 5 endpoints can be detected while 3 endpoints with AT-500N/AT-420N.



This form is useful for samples where the number of inflection points is unknown.

EP Stop

This form stops titration when the preset number of EP is found. However, if titration volume reaches preset amount, it stops titration regardless of the number of EP. The number of detectable EP depends on the connected titrator. When AT-700/AT-510 is connected, 5 endpoints can be detected while 3 endpoints with AT-500N/AT-420N.

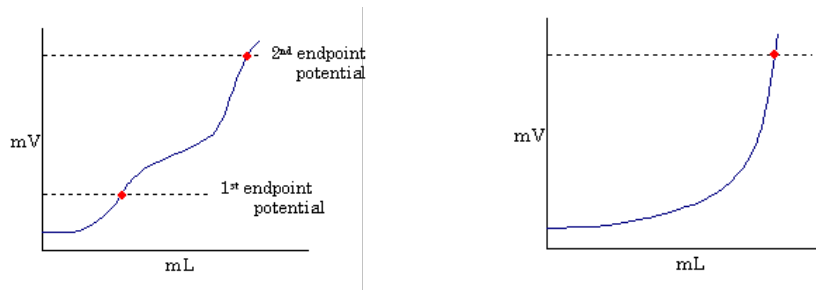


EP is found automatically and finishes when the last one is found.

This form is the most popularly practiced titration. The sharpest potential change is determined to be the endpoint. This titration is least affected by titration condition while satisfactory repeatability can be expected. If the inflection point is unclear, Level Stop form is recommended.

Level Stop

This form titrates until it reaches the second EP potential level. If it titrates to the maximum volume, it aborts titration regardless the number of EP found on the way. EP potential level can be set up to 2 points. If only one EP is preferred, enter the same potential for both first and second EP levels. Titration stops when the second present EP level is reached.

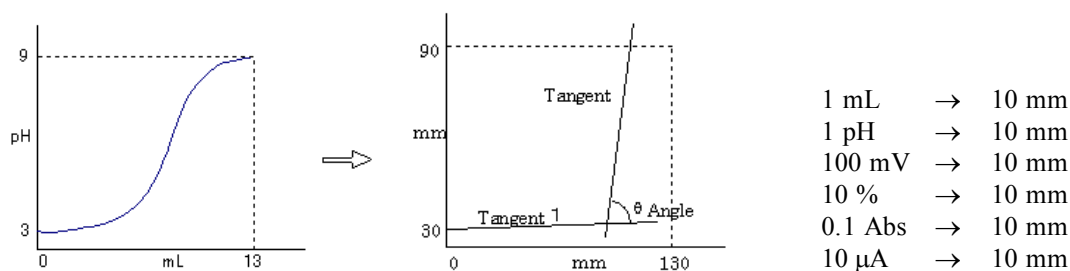


EP Level Stop is used in titration where the end potential is already known in advance like measurement of M-alkali, P-alkali or non-aqueous buffer method for petroleum products neutralization titration.

Intersect

This titration finishes when preset number of EP is detected, however, if the maximum volume is titrated, it aborts titration regardless of the number of EP found on the way. This form is used in titration like diazotation, conductivity or photometric titration. The endpoint is automatically determined by the intersection of 2 lines when the angle changes larger than preset slope on titration curve. Up to 3 endpoints can be detected.

The below graphics show the intersection where the angle is obtained by converting titration volume and potentials to physical lengths.

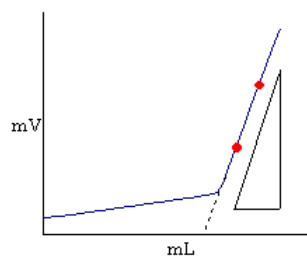


Note:

This form is not available with AT-700 or AT-500N.

Stat

This titration form doses by controlled parameter and maintains the preset potential, and titrates up to the maximum volume or to the time limit. The data are recorded with potential and titration volume at each sampling time.



It titrates up to the maximum volume or to the time limit.

Note:

This form is not available with AT-500N.

3-6-1-3. Detector number and unit

The below chart shows the relation between preamplifier type and unit. Preamplifier is selected according to the type of titration.

Preamplifier		Detector No.1	Detector No.2	Detector No.3
STD-	Standard	pH/mV	mV	—
PTA-	Photometric	pH/mV	mV	%T/Abs
POT-	Polarization	pH/mV	mV	μ A/mV
CMT-	Conductivity	pH/mV	mV	μ S/cm
TET-	2-way pH input	pH/mV	mV	pH/mV

Standard (STD-)

For acid/base titration, redox titration, chelate titration with ion electrode and precipitation titration.

Photometric (PTA-)

For photometric titration by light transmission method. This preamplifier can be used in chelate titration by indicator method, acid-base titration, redox titration, etc.

Polarization (POT-)

For constant current polarization titration (Max.20 μ A), constant voltage polarization titration (Max. 500mV) used in measurement of bromine number, diazotation, etc.

Conductivity (CMT-)

For conductivity titration as well as acid-base titration.

2-way pH input (TET-)

For acid/base titration, redox titration, chelate titration with ion electrode and precipitation titration. 2-way input is possible.

Note:

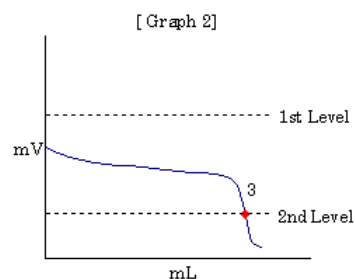
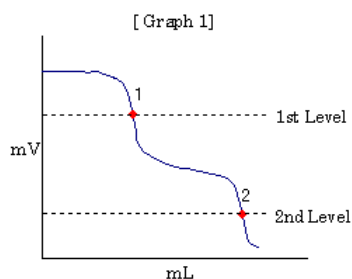
This preamplifier is not available when AT-700 is connected.

3-6-1-4. EP sensing and turning direction

Below descriptions explain the endpoint sensing direction and endpoint turning direction.

EP sensing direction

< in case of Level Stop >



[Auto]

No titration direction is sensed so that all of EP 1, 2 and 3 are detected in normal condition. EP titration volume of 1st Level in Graph 2 is 0mL.

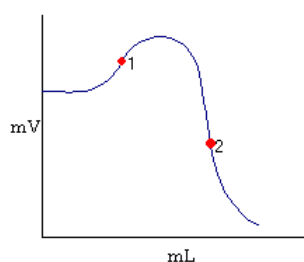
[Negative direction]

The direction is toward negative phase so that all of EP 1, 2 and 3 are found in normal condition. EP titration volume of 1st Level in Graph 2 is 0mL.

[Positive direction]

Since titration is directed toward negative phase, no endpoints can be found.

< in case of Full titration and EP Stop >



[Auto]

No titration direction is sensed so that both EP 1 and 2 are detected.

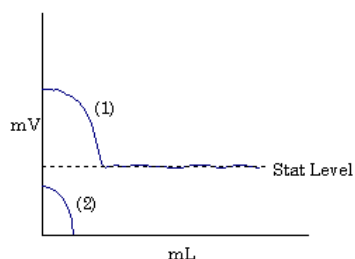
[Negative direction]

The direction is toward positive phase so that only EP 2 is detected.

[Positive direction]

Since titration is directed toward negative phase, only EP1 is found.

< in case of stat titration >



[Auto]

Titration solution is dosed in normal condition when start potential is positioned at 1.

When start potential is 2, the titration solution is going to dose up to Stat Level but the potential direction is reverse against Stat Level, it continues to dose up to maximum volume. (Over-titration)

[Negative direction]

Titration goes on in normal condition at start potential both 1 and 2.

Titration stops dosing when start potential 2 exceeds Stat Level.

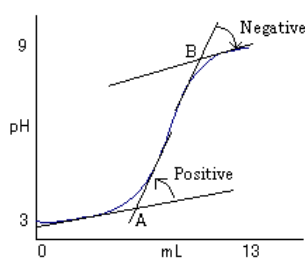
[Positive direction]

No solution is dosed at start potential 1.

When start potential is 2, the titration solution is going to dose up to Stat Level but the potential direction is reverse against Stat Level, it continues to dose up to maximum volume. (Over-titration)

EP turning direction

This function determines the endpoint at the intersection automatically when the changing direction of 2 lines is defined.



[Both]

The intersection A and B of 2 lines is regarded as the endpoint.

[Positive direction]

The intersection A of 2 lines directed counterclockwise is selected as EP.

[Negative direction]

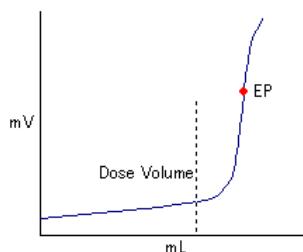
The intersection B of 2 lines directed clockwise is selected as EP.

3-6-1-5. Dose mode

< Volume stop mode >

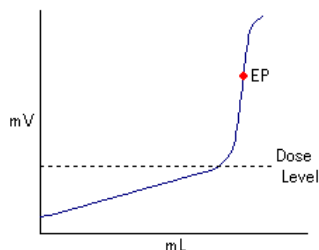
This mode doses the fixed amount of solution for titration or pre-treatment.

The burette number for dose can be selected.



< Level stop mode >

Dosing solution for titration or pre-treatment continues until preset level is detected. The burette number for dose and its preamplifier can be selected.

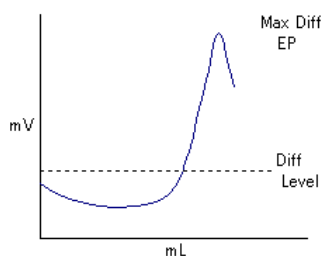


< Differential stop mode >

It continues dosing solution for titration or pre-treatment until present differential level (potential difference against micro amount of titration) is detected.

The burette number for dose and its preamplifier can be selected.

Though titration start potential may change, if the potential difference on titration curve is stable (dE/dmL micro potential is stable), measurement time can be shortened by applying micro potential mode.



Note:

This Dose mode is not available when AT-700 is connected.

3-6-2. Control parameter

The display for setting control parameters differs according to titration mode and form parameter.

< AT-510, AT-500N, AT-420N Connect >

Note:

**When AT-500N or AT-420 is linked, there can be invalid parameters.
Regarding valid parameters, see the Operation manual for each titrator.**

The screenshot shows the 'Acidity.ms1 - Edit Method File' window with the 'Control' tab selected. The parameters and their values are as follows:

Parameter	Value
End point number	1
End Sense	Auto
dE Sense	50 dE
dE/dmL Sense	100 dE/dmL
Auto simulation	On
EP Area	Off
Lower volume	0 mL
Upper volume	20 mL
Lower level	-2400 mV
Upper level	2400 mV
Separation	Off
Level	0 mV
Level stop	Off
End level	0 mV
Titration over volume	0 mL
Gain	1
Data sampling potential	4 mV
Data sampling volume	0.5 mL
Control speed mode	medium
Control speed	2

[End point number]

Here you can set up a number of endpoints to be detected. The titration will end after the same number of endpoints is found as defined at start. The number of endpoint should be set at "2" when "Level stop" is selected as Titration form of Titration parameters for AT-500N or AT-420 system.

[End Sense]

Select a way how to determine EP as follows

- Auto EP sense level is automatically defined. Titration starts with EP sense level of default value preset in plant before shipment, however, if EP is not found, it changes automatically to an appropriate level.
- Fixed The endpoint is determined when the following 2 targets are satisfied. (EP sense potential and EP sense differential level)

[dE Sense]

Enter EP sense potential (E6).

When the difference between potential (E2) where maximum differential value is found and potential E1 where minimum differential is found is larger than $(E2-E1)$, the position is determined as the endpoint.

Set up EP sense potential carefully so that the endpoint can be found even when the inflection point is vague or titration curve appears with noisy spikes.

[dE/dmL Sense]

Enter EP sense differential value (E7).

When the difference between maximum differential value ($dE2/dmL$) and minimum differential ($dE1/dmL$) is larger than $(dE2/dmL-dE1/dmL)$, the position is determined as the endpoint.

Set up EP sense potential carefully so that the endpoint can be found even when the inflection point is vague or titration curve appears with noisy spikes.

[dDegree Sense]

When the slope changes more than preset angle on titration curve, obtain the intersection of 2 lines. (Refer to Auto Intersect)

[1st End Level]

Enter the first EP potential in EP potential setup titration.

[2nd End Level]

Enter the second EP potential in EP potential setup titration. If the same value entered as the first one, the endpoint will be only one.

[End time] (Titration mode: Karl Fischer titration, COD titration)

Enter the time to determine the endpoint.

[Auto simulation]

When this setting is active and if titration ends without finding an endpoint, it resumes titration to find out EP.

[EP Area]

Select EP detection range. The endpoint within the following range is going to be determined as EP.

[Lower volume]

Select the lowest titration volume.

[Upper volume]

Select the highest titration volume.

[Lower level]

Select the lowest potential.

[Upper level]

Select the upper most potential.

[Separation] (Separation)

Set up separation potential level.

[Level] (Separation Level)

This is useful for a sample of which first EP (or inflection points) is mixed and unclear at start of titration. When potential level is set beyond the inflection points or level, the inflection point beyond preset level is determined as EP2 regardless of inflection points at start. (Refer to 3-6-2-2. Separation level)

[Level stop]

Select EP level setup for the first endpoint.

[End level]

< When Auto EP Stop is chosen for titration form >

Set up EP level when separation level is selected. If an inflection is not found, the preset level can be regarded as an endpoint. This is useful for a sample of which inflection point is unknown. (Refer to Separation EP level)

< When titration form is Karl Fischer titration or COD titration >

EP potential, normally 75mL is preset for Karl Fischer titration.

[End time] (Titration mode : Karl Fischer titration, COD titration)

Enter EP sense time. If the time elapses and passes beyond EP level, that point is regarded as the endpoint. Set to 30 seconds for both Karl Fischer and COD titration.

[Titration over volume]

Enter over-titrated volume. Titration, which already has found an endpoint continues till the volume preset here is titrated.

[Gain]

Enter the amplified number of normalization potential (1 to 10).

If the titration results with less than 25 EP sense potential or below 50 differential, set Gain to 2 to 4.

[Data sampling potential]

The data sampled previously shows potential deviation more than the level entered here, those data are taken into the data list and recorded. The potential input here shall be normalization potential. The smaller the input, the larger the data increases. Be aware of the maximum number of data (MAX : 256).

[Data sampling volume]

The data sampled previously shows titrated deviation more than the volume entered here, those data are taken into the data list and recorded. The smaller the input, the larger the data increases. Be aware of the maximum number of data (MAX : 256).

[Dosing time] (Titration form: Stat titration)

The data taken at intervals preset here are recorded in the data list.

[Control speed mode]

Here you select dose speed. The speed is preset to titration form as below:

Titration form	Parameter	Speed		
		Fast	Medium	Slow
Auto	Control speed	4.0	2.0	0.5
Auto Intermit	Stability	10	3	0.5
	Delay time	0	0	1
	Limit time	30	30	30
Intermit	Cut-off time	1	5	10
	Unit volume	0.05	0.02	0.01
	Dispense speed	1	1	1

[Control speed] (Titration form: Auto)

Enter speed for Auto control titration form. Set speed to slow (0.5 to 1.0) for samples of slow reaction and with little potential change.

[Control speed] (Titration form: Auto)

Enter speed for Auto control titration form. Set speed to slow (0.5 to 1.0) for samples of slow reaction and with little potential change.

[Stability] (Titration form: Auto Intermit, blank titration)

Dosing starts when the normalization potential per second is smaller than the potential entered here.

[Delayed time before stability sensing] (Titration form: Auto Intermit, blank titration)

Enter delay timing before potential stability is sensed after dosed. Set delay timing to 10 to 30 seconds for slow reaction.

[Limit time] (Titration form: Auto Intermit, blank titration)

Enter time limit for stability sensing. If the time elapses, dosing starts.

[Cut-off time] (Titration form: Intermit titration)

Enter wait time for cutoff dosing. Zero (0) second means continuous constant speed titration.

[Unit volume] (Titration form: Intermit titration)

Enter dose volume each time at intervals.

[Dispense speed] (Titration form: Intermit titration)

Enter dose speed (sec/mL).

[Relative potential to change dose speed] (Titration form: Stat titration)

Dose speed changes as from the potential entered here. Enter relative potential to the controlled potential.

[Dose speed to relative potential] (Titration form: Stat titration)

Select dose speed from titration start to relative potential to change speed.

[Stat control potential] (Titration form: Stat titration)

Enter the control potential in stat titration

[Limit time] (Titration form: Stat titration)

Enter the time to finish stat titration.

[Offset potential] (Titration form: Stat titration)

Enter the dead zone potential, which is relative to stat control potential.

[Dosing time (Constant: VT1 to VT5)] (Titration form: Stat titration)

Set up dose sampling time (time length counted from starting stat titration), which is used in calculation as VT1 to VT5.

[Integral time] (Titration mode: Petroleum titration, Petroleum titration2)

Select time length to read potential for stability sensing. 60 seconds means it spends 60 seconds to sense stability.

[Time limit for stability sense at start] (Titration mode: Petroleum titration)

Enter limited time length in sensing stability at start of titration. When it exceeds the time, dosing starts. 0 second means no limit.

[Limit time] (Titration mode: Petroleum titration, Petroleum titration2)

Enter time limit to sense stability each time of potential reading. When the time elapses, dosing starts. 0 second means no limit.

[1st Delivery volume] (Titration mode: Petroleum titration)

When potential change after dose is smaller than the dose volume switching potential, the value entered here is to be the dose volume.

[2nd Delivery volume] (Titration mode: Petroleum titration)

When potential change after dose is larger than the dose volume switching potential, the value entered here is to be the dose volume.

[Stability] (Titration mode: Petroleum titration, Petroleum titration2)

When normalization potential per second is smaller than the input level here, it determines the status is stable and starts dosing. Even if potential reading time is not 60 seconds, enter value converted to 60 seconds.

[dE (1st-2nd) potential] (Titration mode: Petroleum titration)

When potential change becomes larger by chemical reaction and potential difference becomes larger before and after dose, dose volume will change. When potential difference is smaller than the value entered here, it is regarded as the first dose volume, and if larger, it is second dose volume.

[Cut-off time (1st)] (Titration mode: Petroleum titration2)

Set up cut-off time to change dose volume.

[Unit Volume (1st)] (Titration mode: Petroleum titration2)

Enter the first unit volume.

[Dispense Speed (1st)] (Titration mode: Petroleum titration2)

Set up dispense speed (sec/mL) of 1st unit volume.

[Cut-off time (2nd)] (Titration mode: Petroleum titration2)

Set up cut-off time between potential where dose volume is changed and end of titration.

[Unit Volume (2nd)] (Titration mode: Petroleum titration2)

This is the dose volume of after reaching potential where dose volume is changed.

[Dispense Speed (2nd)] (Titration mode: Petroleum titration2)

Set up dispense speed (sec/mL) of 2nd unit volume.

[1st→2nd Potential] (Titration mode: Petroleum titration2)

Set up potential where dose volume is changed. Once it reaches set level (pH or mV), dose volume of intermittent titration will change from the 1st unit volume to the 2nd unit volume. When potential, where dose volume is changed, is already reached or exceeded at the start of titration, dose will be made at 2nd unit volume if you specify the direction of titration parameters.

[1st→2nd Wait Time] (Titration mode: Petroleum titration2)

Set up time to wait until next titrant is dispensed after potential where dose volume is changed is reached.

[Stability] (Titration mode: Petroleum titration2)

Select (Off/Set) stability judgment after dosing titration solvent (1st unit Volume and 2nd unit Volume).

[Print] button

Prints out this method parameter.

[Save] button

Saves currently edited contents in [Edit Method file] dialog box and closes the box. At this time, the [Comment setup] dialog box will appear and, please input the reason for updating and the like.

Note:

Please be sure to input comments. The data cannot be saved without inputting comments.

[Close] button

It closes the dialog box without saving the contents of the settings for the [Edit Method File] dialog box under edit.

< AT-700 Connect>

Acidity.ms71 - Edit Method File

Titration / Dose Control Formula Pre-Dose Operating Procedure Guide

End point number Rel. Change Level mV

1st End Level mV change dose speed sec/mL

2nd End Level mV Lag Time sec

Gain Stat Level mV

Control speed mode Limit Time sec

Cut-off time sec Offset potential mV

Unit volume mL Volume Samp. Time

Dispense speed sec/mL VT1 sec

Stir. Speed VT2 sec

VT3 sec

VT4 sec

VT5 sec

Save Close Print

[End point number]

Here you can set up a number of endpoints to be detected. The titration will end after the same number of endpoints is found as defined at start. The number of endpoint should be set at “2” when “Level stop” is selected as Titration form of Titration parameters for AT-500N or AT-420 system.

[1st End Level] (Titration form: Level Stop)

Enter the first EP potential in EP potential setup titration.

[2nd End Level] (Titration form: Level Stop)

Enter the second EP potential in EP potential setup titration. If the same value entered as the first one, the endpoint will be only one.

[Gain]

Enter the amplified number of normalization potential (1 to 10).

If the titration results with less than 25 EP sense potential or below 50 differential, set Gain to 2 to 4.

[Control speed mode] (Titration mode: Auto titration, Auto intermit)

Choose your desired speed out of the following modes:

- Fast..... For fast reaction like strong acid – strong base..
- Medium.... For typical measurements like weak acid – weak base · strong acid – weak base.
- Slow For slow reaction in dilute titrant (e.g. no more than 0.01mol/L).

[Cut-off time] (Titration mode: Intermit titration, Stat)

Enter wait time for cutoff dosing. Zero (0) second means continuous constant speed titration.

[Unit volume] (Titration mode: Intermit titration, Stat)

Enter dose volume each time at intervals.

[Dispense speed] (Titration mode: Intermit titration, Stat)

Enter dose speed (sec/mL). A dispense speed is the speed after [Relative potential to change dose speed] is reached when [Titration mode] is [Start].

[Stirrer speed]

Here you can select an initial stirrer speed for titration. You can select a speed appropriate for sample properties.

[Relative potential to change dose speed] (Titration mode: Stat)

Dose speed changes as from the potential entered here. Enter relative potential to the controlled potential.

[Dose speed to relative potential] (Titration mode: Stat)

Select dose speed from titration start to relative potential to change speed.

[Dosing time] (Titration mode: Stat)

The data taken at intervals preset here are recorded in the data list.

[Stat control potential] (Titration mode: Stat)

Enter the control potential in stat titration

[Limit time] (Titration mode: Stat)

Enter the time to finish stat titration.

[Offset potential] (Titration mode: Stat)

Enter the dead zone potential, which is relative to stat control potential.

[Dosing time (Constant: VT1 to VT5)] (Titration mode: Stat)

Set up dose sampling time (time length counted from starting stat titration), which is used in calculation as VT1 to VT5.

[Print] button

Prints out this method parameter.

[Save] button

Saves currently edited contents in [Edit Method file] dialog box and closes the box. At this time, the [Comment setup] dialog box will appear and, please input the reason for updating and the like.

Note:

Please be sure to input comments. The data cannot be saved without inputting comments.

[Close] button

It closes the dialog box without saving the contents of the settings for the [Edit Method File] dialog box under edit.

3-6-2-1. About normalization potential

The normalization potential is the potential value calculated to eliminate the difference from the titration condition caused by the preamplifier. This is used in control, data sampling and endpoint determination.

Actually the measured potential by sampling is converted to the below values in chart.

Preamplifier	Unit	Actual potential	Normalized potential
STD-TET-	mV	-2,000 to +2,000 mV	-2,000 to +2,000 mV
	pH	0 to 14 pH	0 to +1,000 mV
PTA-	%T	0 to 100 %T	0 to +1,000 mV
	Abs	0 to 1 Abs	0 to +1,000 mV
POT-	μ A	0 to 100 μ A	0 to +1,000 mV
	mV	0 to 2,000 mV	0 to +1,000 mV
CMT-	μ S	0 to 100,1000,10000 μ S	0 to +1,000 mV

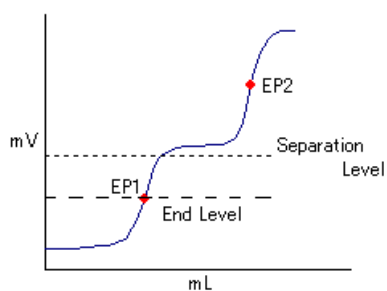
For example: The relation of actual potential and normalized potential are as follows when PTA preamplifier is used and the unit is

Actual potential	0 %T	→	Normalized potential	0 mV
Actual potential	50 %T	→	Normalized potential	500 mV
Actual potential	100 %T	→	Normalized potential	1,000 mV

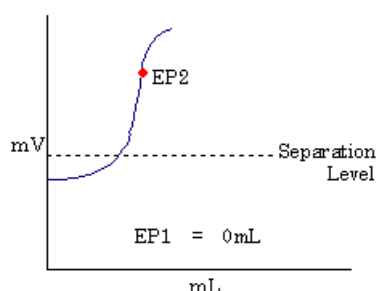
3-6-2-2. Separation level

This function can be used in Auto EP Stop titration only.

When a potential beyond the inflection point or points is selected here, the inflection point detected beyond the preset level can be EP2 regardless of any or no inflection point at start. This is useful for samples of which inflection point is unclear at start, especially there exists a mixture of endpoints with EP1.



When the first EP is detected



When the first EP is not found

By setting EP potential, such level is taken for the first EP in case EP1 is not found at the inflection point.

3-6-3. Pre-Dose parameter

Note:

The Pre-Dose parameter cannot be used on the titration programme where AT-510, AT-500N or AT-420N is connected.

Here you configure calculation parameters following the display guides. Predosing conditions on a sample before measurements is set. Samples can be previously dispensed with up to 5 burettes.

The screenshot shows a software window titled "Acidity.ms71 - Edit Method File". It has several tabs: "Titration / Dose", "Control", "Formula", "Pre-Dose" (which is selected), and "Operating Procedure Guide". The "Pre-Dose" tab contains five sections, each for a "Pre-Dose Para." (1 through 5). Each section has a "Dose Mode" dropdown menu, all of which are currently set to "None", and a button labeled "Ditaile". At the bottom of the window are three buttons: "Save", "Close", and "Print".

[Titration contents]

Here you can select a dose mode from the followings:

- None No dosing is applied.
- Volume Stop Dose a reagent up to preset volume on [Stop volume]. Use a reagent to dose when a reagent volume is fixed.
- Level Stop Dose up to the potential level preset on [Stop level]. When the potential at inflection points is stable, you can predose by "Level stop" regardless of titration volume.

[Detaile]

When this button is pressed, [Pre-Dose Para.] dialog box appears.

Pre-Dose Para.

Dose Mode Level Stop

Burette No. 1 Channel Unit Detector No.1 / mV

Stop Volume 20 mL Dispense 50 sec/mL

Stop Level 0 mV Direction Auto

Cut off 1 sec Wait Time 0 sec

Unit Volume 20 mL Stir. Speed 4

Unit file name EDTA2Na_0.01 M.utf

OK Cancel

[Burette No.]

Enter the burette number for fixed dose.

[Stop Volume]

Enter reagent volume to dose and stop.

[Stop Level]

Enter the potential to end dosing.

[Cut off]

Enter interval time for cutoff dose. Reagent is dosed at every interval. 0sec means continuous constant speed dosing.

[Unit Volume]

Enter the amount of dose at a time during cutoff.

[Channel Unit]

Select Detector number and its unit for fixed dose. Select the same number for detector as preamplifier port connected to the electrode. As to the unit, select an appropriate unit according to the preamplifier.

- Detector No.1/pH (acid-base titration)
- Detector No.1/mV (acid-base titration, redox or precipitation)
- Detector No.2/mV (redox or precipitation titration)
- Detector No.3/pH (acid-base titration)
- Detector No.3/mV (acid-base titration, redox or precipitation, constant current polarization)
- Detector No.3/u A (constant voltage titration)
- Detector No.3/%T (photometric titration)
- Detector No.3/Abs (photometric titration)
- Detector No.3/100uS (conductivity titration)
- Detector No.3/1000uS (conductivity titration)
- Detector No.3/10000uS (conductivity titration)

[Dispense]

Enter the speed for fixed dose.

[Direction]

Select the direction to find out EP from the following 3 types.

- Auto
- Positive
- Negative

[Wait Time]

Enter the time length from start titration to start dosing.

[Unit filename]

Select reagent unit filename for fixed dose. Measurement can be performed without selecting reagent unit filename. Reagent unit file can be set up by clicking on [Unit file] command from [Method] menu in titration program.

[Stir. speed]

Here you can select an initial stirrer speed for fixed dose. You can select a speed appropriate for sample properties.

[Print] button

Prints out this method parameter.

[Save] button

Saves currently edited contents in [Edit Method file] dialog box and closes the box. At this time, the [Comment setup] dialog box will appear, please input the reason for updating and the like.

Note:

Please be sure to input comments. The data cannot be saved without inputting comments.

[Close] button

It closes the dialog box without saving the contents of the settings for the [Edit Method File] dialog box under edit.

3-6-4. Formula parameter

Here you configure calculation parameters following the display guides.

Acidity.ms1 - Edit Method File

Titration / Dose Control **Formula** Operating Procedure Guide

Titration contents: Sample EP Priority: EP

	Conc.	Formula	Unit
<input checked="" type="checkbox"/> Formula 1	C01	= (EP1-BL1)*TF*K1*C1/SIZE	
<input checked="" type="checkbox"/> Formula 2	C02	= (EP2-BL1)*TF*K2*C2/SIZE	
<input checked="" type="checkbox"/> Formula 3	C03	= (EP3-BL1)*TF*K3*C3/SIZE	
<input checked="" type="checkbox"/> Formula 4	C04	= (EP4-BL1)*TF*K4*C4/SIZE	
<input checked="" type="checkbox"/> Formula 5	C05	= (EP5-BL1)*TF*K5*C5/SIZE	

	EP position	Decimal	Rounding method	Evaluation	Target value	Criterion
Formula 1	EP1	5	Rounded	Off	0 +/-	0
Formula 2	EP2	5	Rounded	Off	0 +/-	0
Formula 3	EP3	5	Rounded	Off	0 +/-	0
Formula 4	EP4	5	Rounded	Off	0 +/-	0
Formula 5	EP5	5	Rounded	Off	0 +/-	0

Active Constant All Constant Liquid comp.

Save Close Print

[Titration contents]

Select a titration mode out of the following 4 types

- Sample
- Blank
- Factor
- Check

Note:

The titration contents as “Check” are recorded in periodic check record.

[EP priority]

Select priority EP first taken into concentration calculation.

[Formula 1, 2, 3, 4, 5]

When a formula is checked, the formula becomes significant.

Enter or select a formula on the right side of formula. Numeric entry can be made direct into the formula.

On the left side of formula, select a constant to enter calculation results.

When “Factor” or “Blank” is chosen for titration mode and a plural number of measurements is made under the same Method file, the average of the results is automatically taken into Mean constant.

Note:

The means Factor and Blank values will be substituted in the constants for mean (FAVE1 to FAVE5 or BAVE1 to BAVE5) corresponding to the calculation number.

When Method file is changed, the mean value will be cleared.

[Unit]

Select or enter a unit for calculation results.

[EP Position]

Select EP position to execute calculation (Not to set up or select from EP1 to EP5). For Stat titration, choose “Not to set up”.

[Decimal]

Enter a number of digits after decimal point for calculation results.

[Rounding method]

Select a method for how to calculate out of the following 3 methods.

- Round off
- Rounded
- Round up

[Evaluation]

Select an evaluation function for the calculated results. This function outputs the results in red color.

[Target value]

Enter target value for calculation, based on which criterion can be defined.

[Criterion]

Set up a range of calculated results for passing.

[Active Constant]

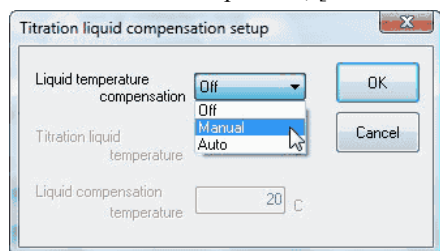
When this button is pressed, the constant used in calculation appears.

[All Constant]

When this button is pressed, the active constants are shown here.

[Liquid comp.]

When this button is pressed, [Titration liquid compensation setup] dialog box appears.

**[Print] button**

Prints out this method parameter.

[Save] button

Saves currently edited contents in [Edit Method file] dialog box and closes the box. At this time, the [Comment setup] dialog box will appear, please input the reason for updating and the like.

Note:

Please be sure to input comments. The data cannot be saved without inputting comments.

[Close] button

It closes the dialog box without saving the contents of the settings for the [Edit Method File] dialog box under edit.

3-6-5. Operating procedure guide parameter

Here you set up parameters for operational procedure guide. AT-Win shows the operational steps one after another on display. Refer to 3-6-4-1. Operating procedure guide.

Label	Message	Box Type	Yes/OK	No/Cancel
	Put 5g sample in 200mL beaker.	Input		
	Add pure water to make it total 100mL	Message		
	Set the beaker on the unit and click [OK] butt...	Input Check		

[Use operating procedure guide]

When this item is checked, this function become effective (SOP Macro).

[Character size]

Select the size of character on display.

[Background color]

Select the background color of display. [Color] dialog box appears when [Setting] button is clicked on.

[Insert] button

One step of operational procedure can be inserted before the line where the cursor for the list lies at operational procedure guide tab.

[Add] button

One step of operational procedure can be inserted at the last line of the operating procedure guide tab.

[Edit] button

Here you can edit the operational procedure on the line where the cursor for the list lies at operating procedure guide tab. When this button is clicked on, [Operating Procedure Guide - Edit] dialog box. Refer to 3-6-4-2. [Operating Procedure Guide - Edit] dialog box.

[Delete] button

The line in the list at operational procedure guide where the cursor stays is erased.

[Delete All] button

You can delete all the procedure in the list at operating procedure guide tab.

[Up], [Down]

The cursor moves vertically on procedure steps.

[Preview] button

Here you can test the setup contents. When this button is clicked on, [Use Operating procedure guide - Running] dialog box. You can check if the configured procedure is working as intended.

[Print] button

Prints out this method parameter.

[Save] button

Saves currently edited contents in [Edit Method file] dialog box and closes the box. At this time, the [Comment setup] dialog box will appear and, please input the reason for updating and the like.

Note:

Please be sure to input comments. The data cannot be saved without inputting comments.

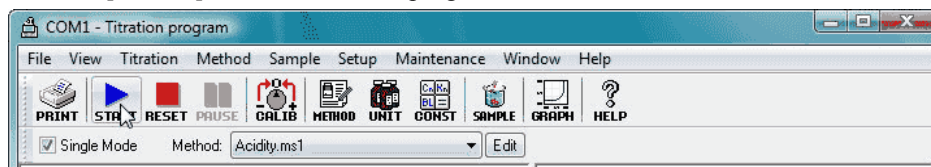
[Close] button

It closes the dialog box without saving the contents of the settings for the [Edit Method File] dialog box under edit.

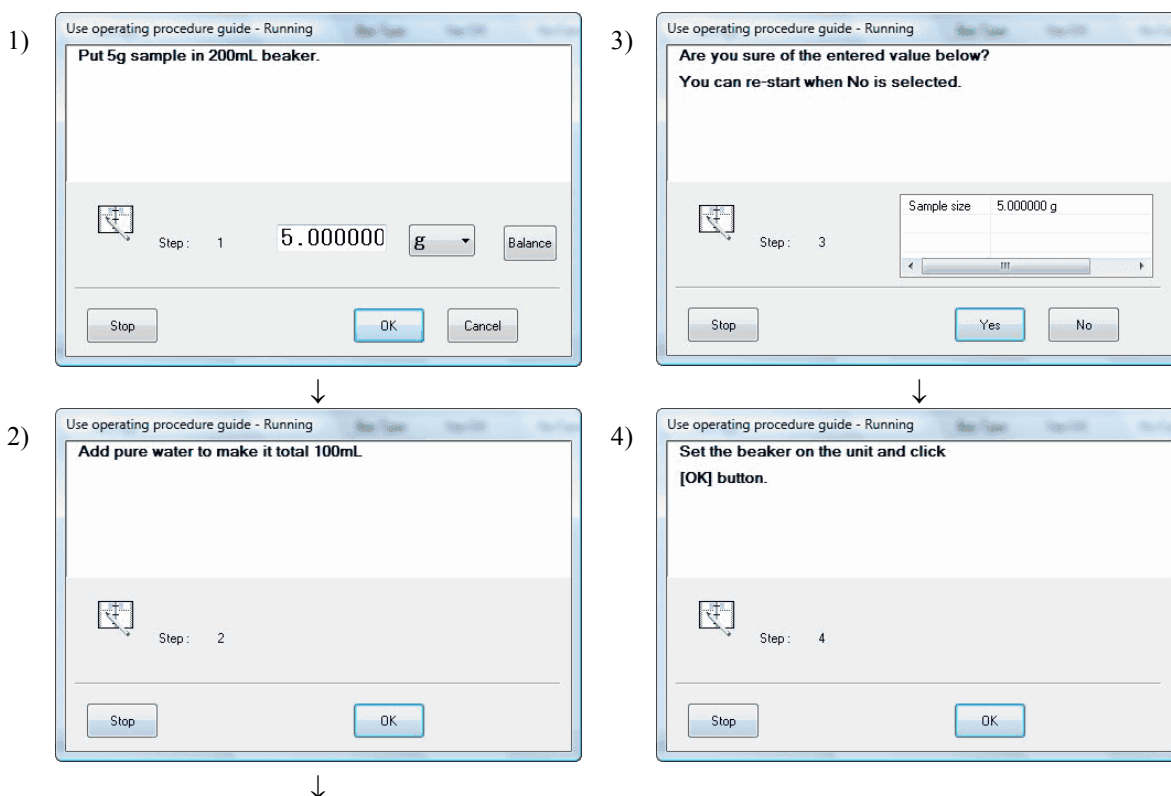
3-6-5-1. Operating procedure guide

This feature prompts operational steps like reagent addition or sample size input on display after titration is started. This helps you ease your work and eliminate operational error in a complex analytical measurement. The below example shows the case of measurement of acidity of orange juice.

Click on [START] button on titration program.

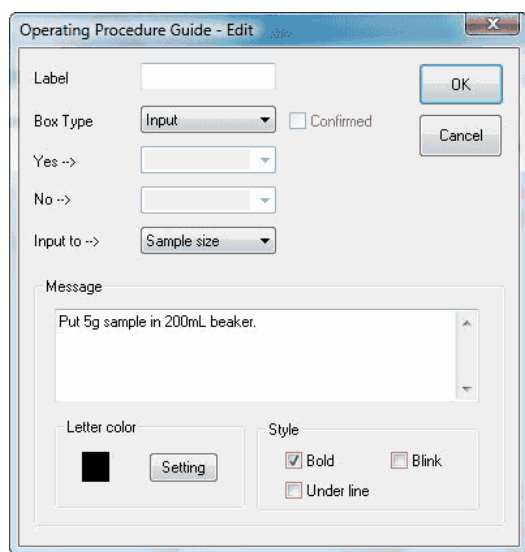


The below dialog box appears from the operating procedure guide.



3-6-5-2. [Operating Procedure Guide - Edit] dialog box

Click [Add] or [Edit] button on Operating Procedure Guide tab to open [Operating Procedure Guide - Edit] dialog box.



[Label]

Enter the label of item for the procedure.

[Box type]

Select the box type according to the order of display. See <Box List> of examples.

[Yes -->]

[Yes] button on Junction (Box) and Unconditional Jump (Box) means the label of destination of jump. Blank means a next Box to appear.

[No -->]

[No] button on Junction Box means the destination of the label of jump. Blank means a next Box to appear.

[Input to -->]

Define a variable to enter into Input Box. The variables to be input are as follows.

- Sample size
- Sample No.
- Lot No.
- Constant 1 to 10

Enter the variable defined by [Sample Constant] command for [Constant Name, Comment] from [Setup] menu of titration program.

[Message]

Enter the message to display in the message column of Box selected for Box type.

[Letter color]

Select desired color for the characters of message.

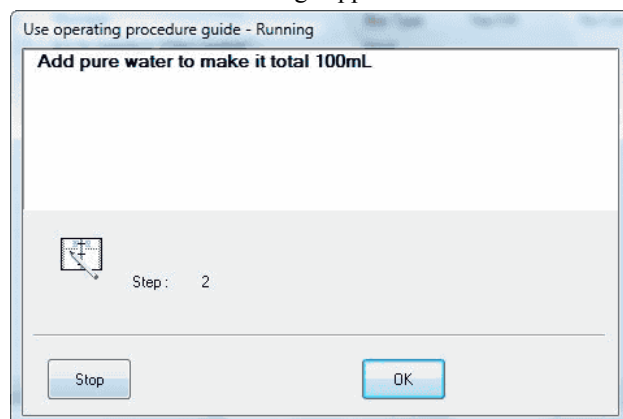
[Style]

Select a style for the character in message column.

< Box List >

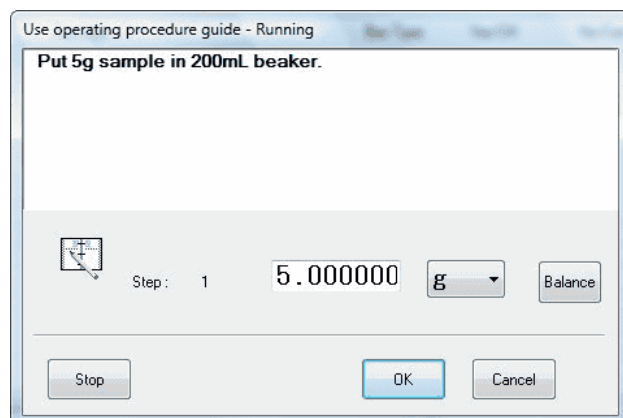
- Message (Box)

This is where the message appears.



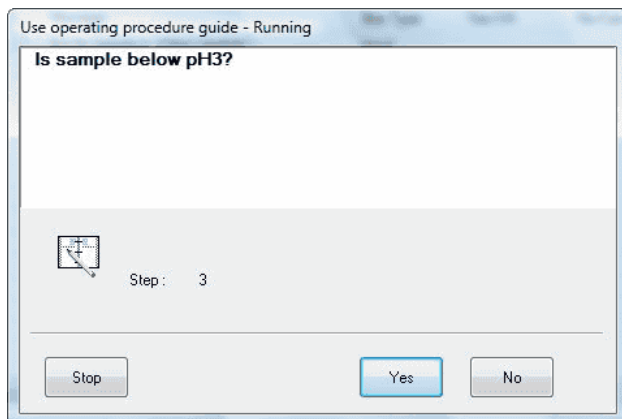
- Input (Box)

Sample size or sample name is input here. Enter the amount for variables to [Input to -->], which is described later on.



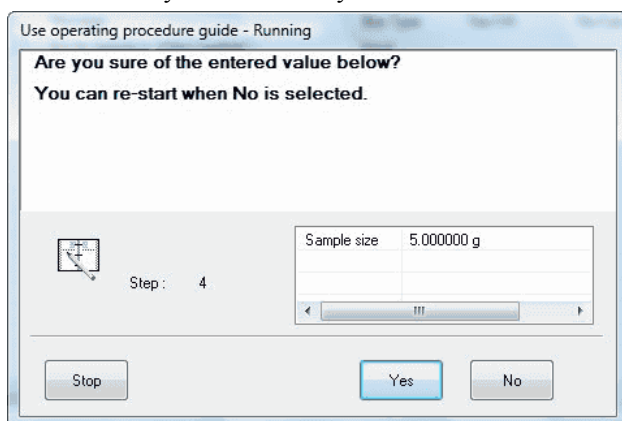
- Branch (Box)

This Box can change the order of operation by the message. You can jump to the defined label with [Yes -->] or [No -->].



- Input Check (Box)

This Box makes sure of entered values in Input Box. When this is set in after every Input Box, you can check on any erroneous entry.



- Jump

This Box jumps to the selected label unconditionally.

- Titration start

This command starts titration by the titrator. The display shows [Now sending...] appears.

- Exit

This button finishes the operating procedure guide.

Note:

- If starting and finishing are preset on Box type, all the operating procedures and display after this box will be voided.
- More than two (2) starting box cannot be preset.
- For those labels like the junction box [Yes ⇒], [No ⇒] or the forced jump box [Yes ⇒], select lower label than those currently selected. Selection of upper label leads to an error.

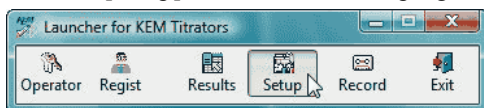
4. Peripherals and versatile titration

4-1. Connecting peripherals

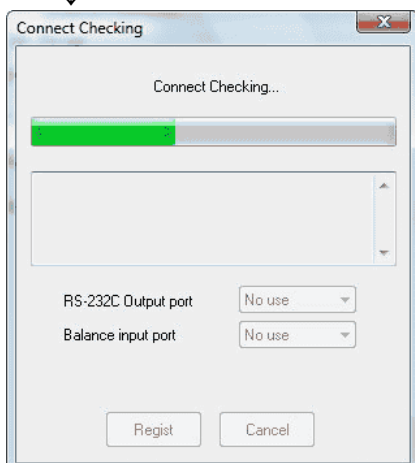
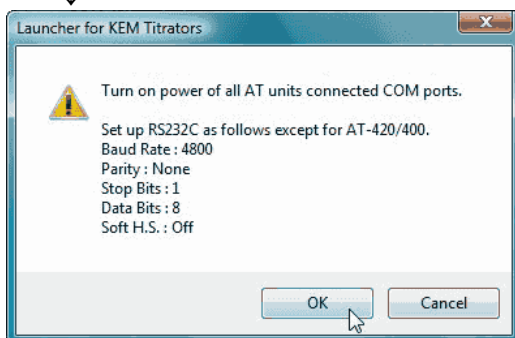
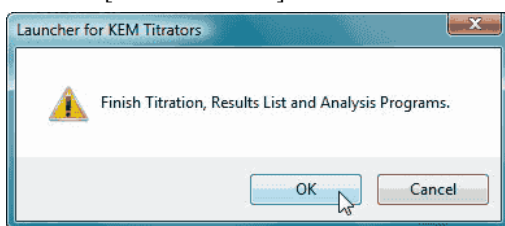
4-1-1. Electronic Balance

The sample weight when sampling for measurement or validating burette precision can be automatically input with an electronic balance connected.

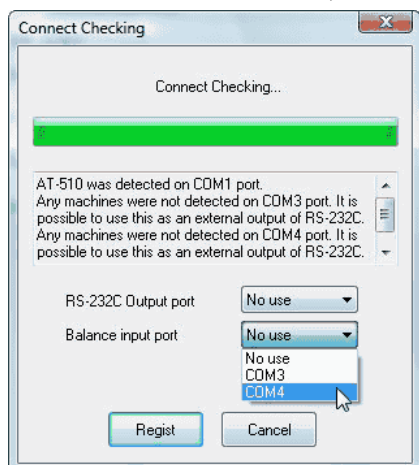
1. Click on [Setup] button of Launcher program to show [Setup] dialog box.



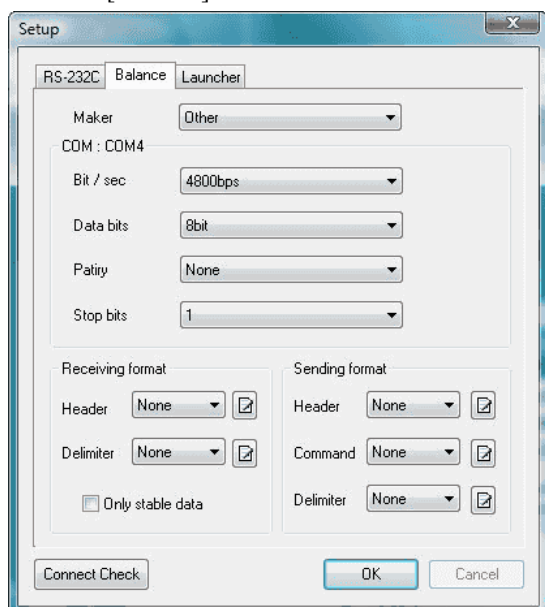
2. Click on [Connect Check] button to show the below message, and open [Connect Checking] dialog box.



3. After connection is confirmed, select an open port for the balance. Click on [Regist] button.



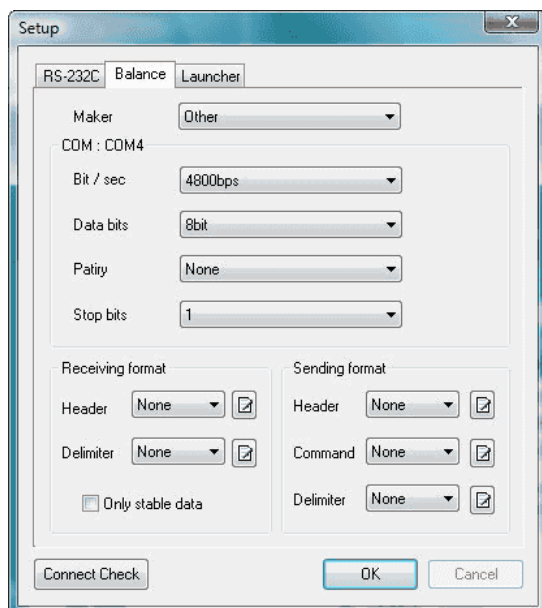
4. Click on [Balance] tab.



5. Configure balance setup. For details of [Balance] tab, see 4-1-1-1. Communication protocol with Balance.

4-1-1-1. Communication with Balance

Here you set up protocol for communication with an electronic balance.



[Maker]

Select a balance maker's name. The balances that are compatible with titrators can be seen in “Balance information” in the [Help] menu. The following makers' balance is available

- KEM
- Shimadzu
- Mettler Toledo
- Sartorius
- A&D
- Others

[COM :]

The COM port number to connect with a balance is shown here.

[Bit/sec], [Data bits], [Parity], [Stop bits]

Set up protocol for COM port when “Other” is chosen for maker name.

[Receiving format]

Define data format with header and delimiter when receiving data. This is necessary when “Other” is chosen for maker name.

[Sending format]

Define data format with header, command and delimiter when transmitting data.

[] button

Click on this button to show [Edit Receive/Send Header] where header and delimiter can be edited. This is necessary when “Other” is chosen for maker name.

4-2. Connecting a plural number of titrators

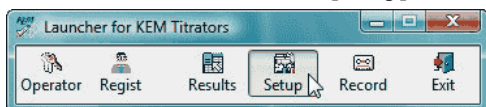
A plural number of titrators can be connected to a personal computer with AT-Win installed if there are open ports for the number of titrators. If more ports are required, install an expansion board to increase available COM ports.

Note:

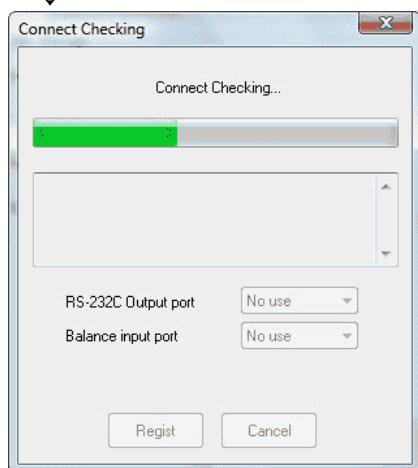
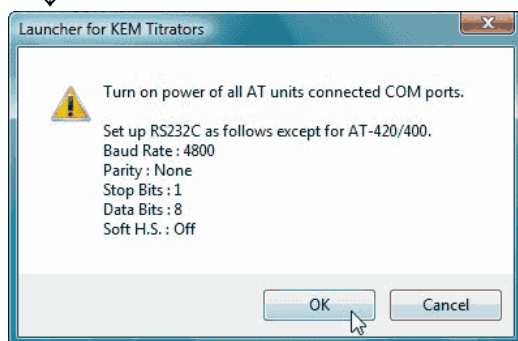
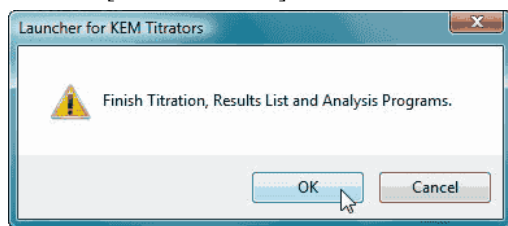
To add more COM ports, read the manual for the expansion board or converter. COM port numbers shall be COM 1 to COM 10. You cannot use COM 11 or later number.

Follow the below procedure for connection

1. Check open ports or add more ports if necessary.
2. Connect the titrator.
3. Set the protocol as follows
 - Baud rate.....4800bps
 - Data bit8bits
 - Stop bit.....1bit
 - Parity.....none
4. Activate AT-Win and click on [Setup] button to show [Setup] dialog box.



5. Click on [Connect Check] button to show below message. Follow the messages.



6. When the results of confirmation appears, check the contents and click on [Regist] button.
7. Click on [OK] button in [Setup] dialog box to close. Make sure Launcher shows [COM...] button on display.

5. Maintenance

5-1. About personal computer

For maintenance and servicing a personal computer with AT-Win installed, refer to the manual for the computer.
This manual does not describe operating procedure for Windows.

5-2. About titrator

For maintenance and servicing the titrator connected to PC with AT-Win, refer to the manual for the titrator.

6. Troubleshooting

6-1. When it does not communicate with titrator

When communication with titrator fails, the titration program sets in [Disconnected] status. Check the connection between PC and titrator.

- Is RS module cable connected?
- Is AC adapter of modem connected? (when AT-420 is connected)
- Is the optical cable connected? (when AT-420 is connected)
- Is the screen display on the titrator turned to that for 'Reset'? (For screen display other than that for 'Reset', "Discontinued" status will apply.)

If your PC is equipped with more than 2 serial ports, make sure the serial port numbers match.

6-2. When the program halts

When the program stops halfway, wait for about 30 seconds. When communication error occurs, corresponding error message appears, and then, the program resumes.

If the program halts for more than 30 seconds, refer to [6.3. When the mouse or key does not work on program].

6-3. When the mouse or key does not work on program

In this case, the titration program has to be re-started as follows

1. Press Ctrl + Alt + Del key.
2. When [Windows Security] appears on the display, select [Task Manager].
3. When [Windows Task Manager] appears on the display, select AT-Win and click on [End Task].
When the mouse does not work, select AT-Win with the cursor and [End Task] with the Tab key, and then press Enter.
4. After waiting for about 10 seconds, the alarm message [The program does not answer] appears. Click on [Close] button to finish titration program.
5. After the titration program is closed, check the connection between PC and titrator and burette. If the titrator is titrating, press RESET key to abort the event.
6. After the connections are checked, re-start the titration program.

6-4. Report in Word is unable to select

[Word report] command is unable to select

If [Word report] command ([File] menu) is unable to select, it means Microsoft Word 98/2000/2002/2003/2007/2010 (hereinafter Word) is not installed or installed incorrectly. Re-install Word program.

Word program activates but does not create Report

If Word program activates but does not create Report when [Word Report] command ([File] menu) is selected, the template file may be destroyed. For its details, refer to Create Report in Your Own Format.

Macro function does not work properly

This software utilizes the macro function, which is standard equipped in Word. Set the macro to Medium or Low. If it is High, the software will not work properly.

6-5. Error appears with [View] button pressed on Navigation

In order to view the application notes by navigation, it is necessary to install Acrobat Reader 4.0 or later version of Adobe system. If it is not installed yet, download Acrobat Reader from Adobe system homepage. You can also access to the software from KEM's homepage.

6-6. The titrator does not respond even if [Reset] or [Pause] command is executed right after titration is started

The titrator is in the state of being unable to communicate — e.g. during dosing by the burette. Wait for about 30 seconds until the titrator can communicate with the PC. If the titrator will not respond even in 30 seconds or so, please refer to “6-1. When it does not communicate with titrator”.

7. Technical data, Warranty and User Registration

7-1. Consumable Parts List

Maintenance

Part Number	Part name	Remark
12-02012	Connecting Cable(9P-9P)	Dsub9pin female, 2m

Option

Part Number	Part name	Remark
98-404-0008 ^{*1}	RS-232C EXT. board	8ch PCI-bus with cable
98-008-0002	Connecting cable set	for AC100V, 10m
98-008-0003	Connecting cable set	for AC120V, 10m
98-008-0004	Connecting cable set	for AC230V, 10m
98-030-5289	TCU Cable	10m
98-350-0005	Optical cable	30m
98-350-0006	Optical cable	50m

- *1 The expansion board can be used only when an IRQ (interrupt request) is '0' to '15'.
This board is not compatible with some sorts of personal computers.

7-2. Technical data

< Software Specifications >

Specification	Description				
Model name	Titrator software compliant with electronic records model AT-Win				
Method		AT-700	AT-510	AT-500N	AT-420/2nd
	Normal method file	yes	yes	yes	yes
	Combined method file	no	yes	no	yes
Titration form	Full titration (EP Stop)	yes	yes	yes	yes
	Auto EP Stop	yes	yes	yes	yes
	EP Level Stop	yes	yes	yes	yes
	Auto Intersect	no	yes	no	yes
	Stat titration	yes	yes	no	yes
Special titration	Dissociation constant (pKa), Auto preamplifier change-over				
Display	Measurement screen	Real time titration curve, titration mode and form, burette No., sample No., Lot No., titration volume and potential			
	Parameter screen	Method parameter (conditions, formula, etc.), sample parameter (sample size, method filename, Lot No., sample name and constant, etc.)			
	Help screen	Operating method, description of parameters, operating manual			
	System information	Connected condition of titrator, power burette, sample changer			
Print	Measurement results, data list, Method parameters, sample parameters. Printout into one sheet (4 data, 2 data, 1 data/sheet)				
Calculation	Up to 5 concentration formulas for each Method. Individual name for each constant, temperature compensation of titration liquid				
Data files	Measurement results and parameters save in hard disk. Number of files depends on capacity of hard disk (periodic data transfer is unnecessary)				
Data processing	Statistics	Mean, standard deviation, relative SD			
	Re-calculation	Sample size, constant, factor, etc.			
	EP re-detection	Auto EP, manual EP, Auto Intersect, Manual Intersect, Limited EP			
	Transfer data	Report in Word, Data saving in CSV or MDB format, External output to PC			
Security	Identify with User ID and password. Management by operated item and level				
Operating guide	Guiding messages like prompting steps, sample size input or commenting				
GLP/GMP	Electrode	Notice of calibration day and record of results			
	Periodic check	Notice of check day with standard and record			
	Burette	Notice of burette capacity validation and record, alarm of remaining reagent and piston head replacement			
	Operational record	Record of operation by AT-Win			
Alarm message	Key entry, calculation error, malfunction alarm, etc.				
Compatible model	AT-700,AT-510, AT-500N				

<Required systems>

Specification	Description
Computer	Personal computer with CPU more than 500MHz * Intel Pentium/Celeron family, AMD K6-2/Athlon/Duron family or Inter compatible CPU
Operating system	Windows 2000 (SP4 or higher)/XP (SP3 or higher)/Vista (Home Basic , Business) /7(Home Premium, Professional)
Others	Internet Explorer 6.0 or later, Adobe Acrobat Reader 4.0 or later
Memory	More than 128MB RAM
Hard disk	At the time of installation : more than 50MB RAM. For data record : Recommend Hard Disk more than 20GB.
Display	More than 1024*768 display
Disk driver	CD-RW driver or DVD-RAM (for backup of data)
Serial port	RS232C D-sub male 9-pin : 1 is required

- 1) Serial port is necessary when a titrator is connected.
- 2) Up to 4 units can be connected by adding RS232C expansion board (option).
Note: more than 1 slot for PCI bus, and PCI bus of Low Profile type may not be able to install.
- 3) In case of a modem already installed, one port may be used and not available.

7-3. Warranty and After-Sale Service

Warranty and After-sales Service

1. Warranty Period

One (1) year from the date of receipt of this product or the date of installation by KEM service personnel or by authorized personnel.

2. Warranty Details, After-sales Service

This product passed the strict inspections of KEM and, except for consumables, KEM warrants this product, under normal use, for one (1) year from the date of receipt of this product or the date of installation by KEM service personnel or by authorized personnel.

Should an initial failure occur during the warranty period, KEM will decide whether to replace the product or to correct defects.

This product can be repaired at user's site by KEM service personnel or by authorized personnel. Note that secondhand or pre-owned products are not covered by warranty.

3. Exclusion

Warranty shall be void where:

- any part is replaced or any repair or remodeling is performed by unauthorized personnel;
- unauthorized service parts, spare parts and/or consumables are used;
- the user does not follow the instructions for installation, correct use, maintenance and/or storage, resulting in malfunction;
- the user does not follow the ranges and/or conditions stated in the product brochure, flyer or specifications;
- periodic checks and/or maintenance is not performed;
- breakage and/or malfunction is caused by careless handling such as, but not limited to, exposing to or submerging in water, or dropping down;
- malfunction is caused by any device, part and/or chemical other than those supplied by KEM;
- this product has been moved or transported to another place once accepted and installed;
- breakage and/or malfunction is caused by conditions beyond control of KEM including, but not limited to Acts of God such as fire, earthquake, lightning strike, flood, etc.;
- Caused by user's computer (e.g., hard disk failure)
- Caused by installation of other software or uninstallation

KEM is also unable to offer warranty and related services of repairs and maintenance checks of any kind once specifications, capability, features and/or functions of this product as well as its parts are changed, altered or remodeled by unauthorized personnel.

4. Disclaimer

KEM is not held liable, during or after the warranty period, regardless of whether loss or damage is caused by any event beyond control of KEM, or it is the user's opportunity loss and/or lost earnings caused by failure or malfunction of KEM products, or with or without predictability of KEM, for loss or damage resulting from a particular reason, secondary loss or damage, accident compensation, damage to products other than those supplied by KEM, and any other incidental compensation.

KEM is also not held liable for physical and/or economic loss or damage resulting from the use of KEM products, or loss of stored data during repair or servicing of such product.

References

<Example of printed results>

1 Result / 1 Page

<< Titration result >>

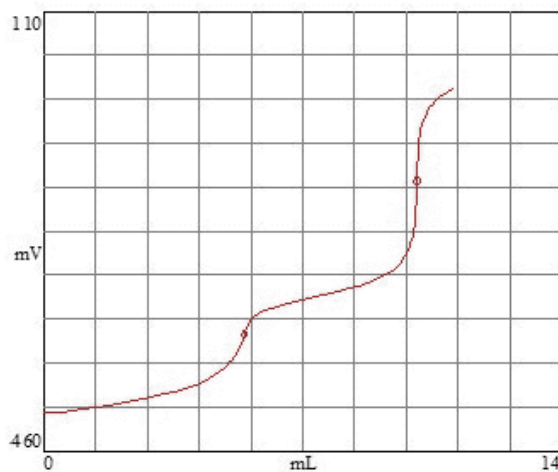
Sample No.	: 01-01	Date & Time	: 09/20/2000 15:25
Model / Serial No.	: AT-510 / NZA09801	Titration time	: 00:13:05
Operator	: MANAGER		
Method filename	: Method03.mtd		
Titration mode	: Auto Titration	Titration form	: EP Stop
Titration burette	: 1	Detection method	: Detector No.2 / mV
Titration reagent	:		
Tit. liquid temp.	: --- C	Liquid comp.temp.	: --- C
Sample name	: KBr,KCl		
Lot No.	:	Sample size	: 5.0000 mL
Init. temp.	: 0.0	Final volume	: 11.0900 mL
Init. level	: -409.4 mV	Final level	: 11.1 mV
Note	: M-214 R-211		

		EP1	EP2	EP3	EP4	EP5
EP volume	[mL]	5.4340	10.0903	-	-	-
EP level	[mV]	-308.9	-110.2	-	-	-

[Result]

CO1	CO2	CO3		
[mg/mL]	[mg/mL]	[-]		
12.93292	15.04464	Error	-	-

[Titration curve]



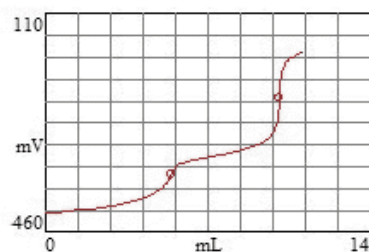
<< Titration result >>

Sample No.	: 01-01	Date & Time	: 09/20/2000 15:33
Model / Serial No.	: AT-510 / NZA09801	Titration time	: 00:13:05
Operator	: MANAGER		
Method filename	: Method03.mtd		
Titration reagent	:		
Tit. liquid temp.	: --- C	Liquid comp. temp.	: --- C
Sample name	: KBr ₂ KCl		
Lot No.	:	Sample size	: 5.0000 mL
Note	: M-214 R-211		

		EP1	EP2	EP3	EP4	EP5
EP volume	[mL]	5.4340	10.0903	-	-	-
EP level	[mV]	-308.9	-110.2	-	-	-

[Result]

1.CO1	=	12.93292 mg/mL
2.CO2	=	15.04464 mg/mL
3.CO3	=	Error



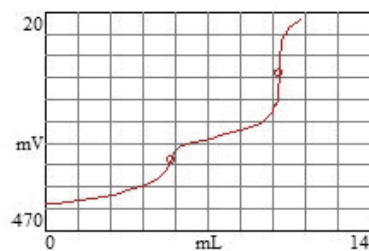
<< Titration result >>

Sample No.	: 01-01	Date & Time	: 09/20/2000 15:13
Model / Serial No.	: AT-510 / NZA09801	Titration time	: 00:12:52
Operator	: MANAGER		
Method filename	: Method03.mtd		
Titration reagent	:		
Tit. liquid temp.	: --- C	Liquid comp. temp.	: --- C
Sample name	: KBr ₂ KCl		
Lot No.	:	Sample size	: 5.0000 mL
Note	: M-214 R-211		

		EP1	EP2	EP3	EP4	EP5
EP volume	[mL]	5.4066	10.0801	-	-	-
EP level	[mV]	-313.3	-117.1	-	-	-

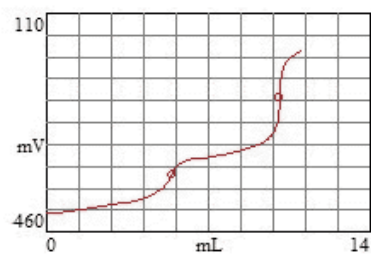
[Result]

1.CO1	=	12.86771 mg/mL
2.CO2	=	15.02943 mg/mL
3.CO3	=	Error



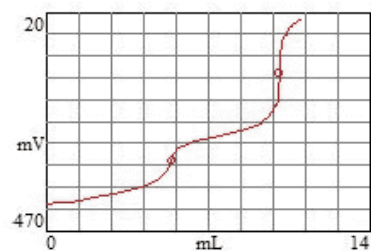
<< Titration result >>

Sample No. : 01-01
 Method filename : Method03.mtd
 Sample name : KBr,KCl
 Lot No. :
 Sample size : 5.0000 mL
 Operator :
 CO1 = 12.93292 mg/mL
 CO2 = 15.04464 mg/mL
 CO3 = Error



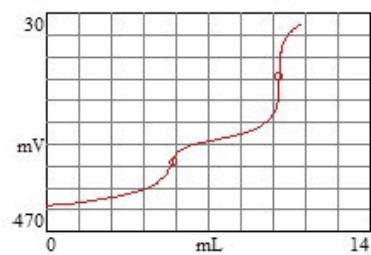
<< Titration result >>

Sample No. : 01-01
 Method filename : Method03.mtd
 Sample name : KBr,KCl
 Lot No. :
 Sample size : 5.0000 mL
 Operator :
 CO1 = 12.86771 mg/mL
 CO2 = 15.02943 mg/mL
 CO3 = Error



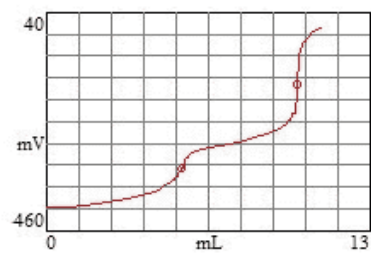
<< Titration result >>

Sample No. : 01-01
 Method filename : Method03.mtd
 Sample name : KBr,KCl
 Lot No. :
 Sample size : 5.0000 mL
 Operator :
 CO1 = 13.02574 mg/mL
 CO2 = 15.01482 mg/mL
 CO3 = Error



<< Titration result >>

Sample No. : 01-01
 Method filename : Method03.mtd
 Sample name : KBr,KCl
 Lot No. :
 Sample size : 5.0000 mL
 Operator :
 CO1 = 12.95791 mg/mL
 CO2 = 15.03017 mg/mL
 CO3 = Error



Result list

<< Titration results list >>

No.	Sample name	IL	Status	& Sample No.	Method filename	Result1	Result2	Result3	Data filename	COM	Operator
5	KBr,KCl			01 - 01	Method03.mtd	12.86771	15.02943		SampleData04(Statistics).atl	1	
6	KBr,KCl			01 - 01	Method03.mtd	13.02574	15.01482		SampleData03(Statistics).atl	1	
7	KBr,KCl			01 - 01	Method03.mtd	12.95791	15.03017		SampleData02(Statistics).atl	1	
8	KBr,KCl			01 - 01	Method03.mtd	13.02764	15.01705		SampleData01(Statistics).atl	1	

<pH temperature compensation table>

Standard	pH liquid	Spec. No.	Standard components
JIS	pH4	JIS K0019	0.05mol/L-Potassium hydrogen phthalate
	pH7	JIS K0023	0.025mol/ L-Potassium hydrogenphosphate – 0.025mol/L-Sodium hydrogenphosphate
	pH9	JIS K0021	0.01mol/L-Sodium tetraborate
ASTM	pH4	E70-97	0.05mol/kg-Potassium hydrogen phthalate
	pH7		0.025mol/kg-Potassium hydrogenphosphate – 0.025mol/kg-Sodium hydrogenphosphate
	pH9		0.01mol/kg-Sodium tetraborate
DIN	pH4	19 266	Dissolve 10.21g (KHC ₈ H ₄ O ₄) in 1000mL (25°C) water.
	pH7		Dissolve 3.38g (KH ₂ PO ₄)+3.53g (Na ₂ HPO ₄) in 1000mL (25°C) water.
	pH9		Dissolve 3.814g (Na ₂ B ₄ O ₇ ·10H ₂ O) in 1000mL (25°C) water.
BS	pH4	1647	Dissolve 10.21g (KHC ₈ H ₄ O ₄) in 1000mL (20°C) water.
	pH7		Dissolve 3.39g (KH ₂ PO ₄)+3.54g (Na ₂ HPO ₄) in 1000mL(20°C) water.
	pH9		Dissolve 3.80g (Na ₂ B ₄ O ₇ ·10H ₂ O) in 1000mL (20°C) water.
NF	pH4	T90-008	Dissolve 10.21g (KHC ₈ H ₄ O ₄) in 1000mL water.
	pH7		Dissolve 3.402g (KH ₂ PO ₄) + 3.549g (Na ₂ HPO ₄) in 1000mL water.
	pH9		Dissolve 3.81g (Na ₂ B ₄ O ₇ ·10H ₂ O) in 1000mL water.

Standard		pH		
NIST	temperature	pH4	pH7	pH10
	0	4.00	7.11	10.32
	5	4.00	7.08	10.25
	10	4.00	7.06	10.18
	20	4.00	7.01	10.06
	25	4.01	7.00	10.01
	30	4.02	6.98	9.97
	40	4.03	6.97	9.89
	50	4.06	6.97	9.83
	60	4.08	-	-
	70	4.13	-	-
	80	4.16	-	-
	90	4.21	-	-
	95	4.24	-	-

Note: The above “NIST Temperature Compensation Table” adopts the temperature table in the ‘pH “All in One” buffer kits (Cat No. 910105)’ made by ORION in the U.S.A.

<About Titration Result Viewer>

The Titration result viewer is a tool that allows you to see the files of titration results (files with the extension ‘.atl’) not through the result list of AT-Win or the Analysis program.

The screen display, the menu configuration, the recalculation function and the like are almost identical to the analysis program of AT-Win, but Titration Result Viewer does not feature the storage of the results of EP re-determination and recalculation.

When a PC with the AT-Win software installed is linked with a network, titration results can be referred to from another PC on the network.

How to install the program:

Run ‘Setup.exe’ in the folder, ‘Viewer’, on the setup CD-ROM for AT-Win set in the PC for installation.

The setup program will be activated and then perform the setup procedures according to the messages on the screen.

How to uninstall the program:

In order to uninstall the program, double-click the Add/Remove Programs icon in the Control Panel and select ‘ATViewer’, followed by clicking the Add/Remove button.

How to use the program:

It is necessary to open the Titration Results first in order to refer to titration results in the Titration Result Viewer.

To do this, click the Open command in the File menu or [OPEN] button on the toolbar for the referring file of titration results.

Since the redetection of endpoint and recalculation are identical to those of the analysis program for AT-Win, please see the Operation Manual of AT-Win or refer to the Help instructions of it.

If you click a [Record] command of [Maintenance] menu, you can see updating history of Titration Results.

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