tiamo[™] – Titration and more



Networked Titration Data System





Networked Titration Data System

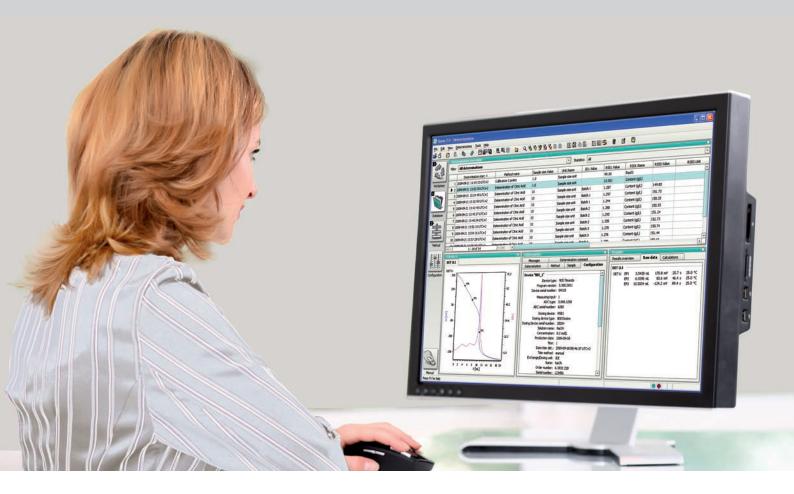






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tiamo[™] points the way

tiamo[™] – titration and more

tiamoTM is a control and database software for titrators and dosing devices as well as for complete laboratory automation, including client-server systems. The name **tiamo**TM stands for «titration and more» – **tiamo**TM can do more than just titrate. **tiamo**TM is a titration network (NTDS = Networked Titration Data System).

tiamoTM is the result of Metrohm's largest and most modern software project. With its numerous innovations, user friendliness and flexibility, **tiamo**TM has been the leading software package for titrations for several years now – now in its second version.

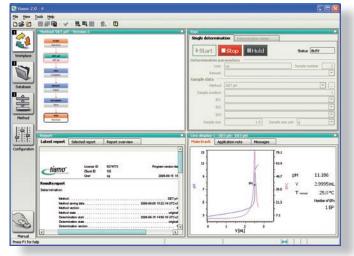
No language barriers

To make use of the benefits offered by **tiamo**TM, you don't need to know any foreign languages. **tiamo**TM is available in numerous language versions, including Chinese, Spanish, French, Italian, Japanese, Polish, Portuguese, Russian, Slovakian and traditional Chinese.

tiamo[™] at a glance

tiamo[™] is easy to use

- New, appealing software interface
- Freely configurable desktop thanks to new Layout Manager
- Powerful report generator
- Automatic database backup
- Graphical method editor
- Easy incorporation of instruments and accessories



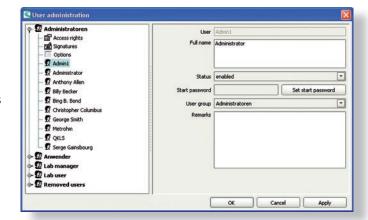
tiamo[™] communicates

- Real client-server database software
- Real parallel titrations
- Data export in XML and other formats
- E-mail function for results and messages
- Extensive online help



tiamo[™] overcomes boundaries

- Central user administration
- Complete traceability of all results
- Extended method commands
- Developed and validated for cGxP
- E-mail functions for determination data and methods
- Numerous import and export functions



tiamo[™] at a glance

The modern user interface makes it easy for you to familiarize yourself with $tiamo^{TM}$. All the commands and controls are to be found where you expect them to be. Using the $tiamo^{TM}$ main symbol bar you can access the five program parts of $tiamo^{TM}$ directly and easily. Each

program part includes the menu and symbol bars for the specific workplace as well as the main window. Depending on how you have configured the access rights, these buttons may be visible or concealed for individual users.



Workplace

- Up to four workplaces can be opened at the same time
- Here you start your methods single determinations or series of determinations

• In the method window you can track the progress of your method in real time

• Here you can change various titration parameters «live» even while the method is underway

• Here you manage your sample tables and sample classification tables

Workplace



Database

Database

- Up to four databases can be opened at the same time
- Here you manage your determination data

• The determination reports are displayed here

- Extensive possibilities for reprocessing and reporting your determinations
- Extensive search and filter functions as well as export and import functions
- Extensive information on the various determinations
- Both manual and automatic backup functions



Method

- Up to nine methods can be opened at the same time and up to two methods can be displayed and processed at the same time
- Here you develop and manage your methods
- Extensive pool of method and calculation templates
- Extensive support functions for method development



Configuration

Method

Configuration

- Includes the menu and symbol bars for the specific workplace as well as the main window, in which six sub-windows can be displayed
- Here you manage instruments, titrants/solutions, sensors and your common variable
- Here you configure all the non-method-specific settings

• For all units managed here, various monitoring functions and GLP test intervals can be set

• Here you configure the user administration, the security settings and the program administration



Manual

Manual

- Here you open the user interface of an external window for manual control of all implemented components (Titrandos, stirrers, pumps etc.)
- Extensive possibilities for direct operation without predefined instructions: direct measuring and dosing are just as possible as direct control of sample processors and remote interfaces

Working with *tiamo*[™] − it's a pleasure

The information windows are in the center of the workplace. In the run window you can comfortably enter all the sample data, whether for a single sample or for complete sample series.

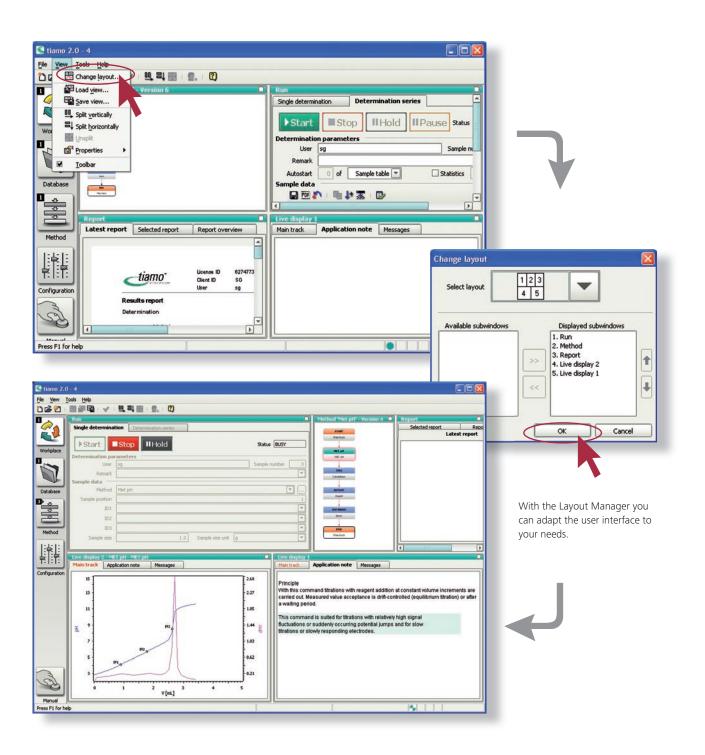
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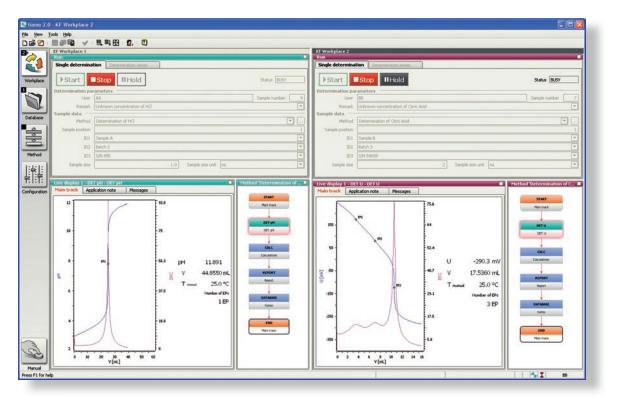
Information window for a determination series

tiamo[™] makes your work easier

Layout Manager – a personal *tiamo*[™] for each user

With the Layout Manager the user interface can be arranged so that each user only sees the windows that are necessary for the task at hand. This saves time; cluttered-up screens are now a thing of the past. You can freely define what information is to be shown in the windows.





Efficient: working at two workplaces that are open at the same time.



Making four from one - parallel titrations

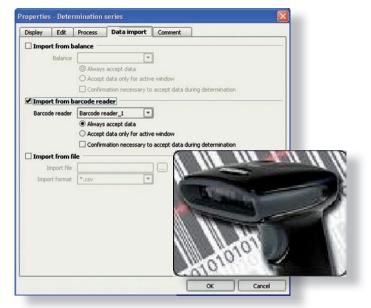
money.

You can subdivide the user interface even further to create up to four independent workplaces. Thus, should the need arise, several titration systems can be controlled by one and the same PC - in parallel and, if necessary, by different users. But that is not all: not only are you able to titrate in parallel at several workplaces - two titrations or measurements can also be carried out in parallel within the same method.

tiamo[™] spares you routine work

Practical text templates

Regardless of whether you enter sample data manually or use a barcode reader, $tiamo^{TM}$ will assist you in completing the sample table in either case. Repetitive identifications can be stored in text templates.



Direct import of sample tables

tiamoTM also takes care of sequential numbering and imports sample tables directly from your LIMS. Surprises in the operation of your sample changers are cannot happen, as **tiamo**TM checks the sample table for any incorrect weights.

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Create links easily

You can use the sample assignment table to link sample numbers with methods. This makes your $tiamo^{TM}$ the easiest to operate routine system in your lab!

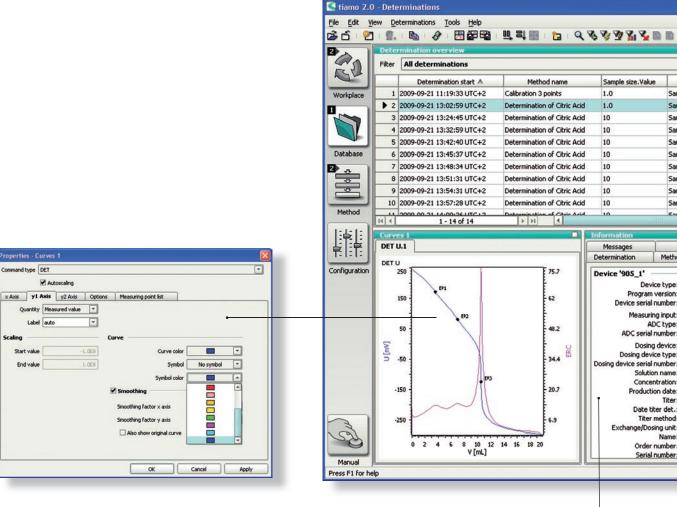
	Assignment ID A	Method
1	Titrant 2	Waterdetermination with Titrant 2
2	Titrant 5	Waterdetermination with Titrant 5
3	User 1	Determination of Citric Acid
4	User 2	Determination of HCI
	•	



Modern data management ...

Manipulation-proof database

The *tiamo*[™] database provides even more added value. Not only your determinations, but also all your settings, methods and user information are stored and are thereby protected reliably against manipulation and loss.



Curve window – watch the curve for each determination

*tiamo*TM shows the titration curve for each determination. The curve layout can be freely defined. A copy-andpaste command is all that is needed to include the titration curve in a Word document.

Total traceability

Who carried out a determination and when? What titrator was used? What alterations were made to the determination and by whom? All this is recorded permanently for each individual determination. The unique traceability of the *tiamo*[™] system leaves no question unanswered.

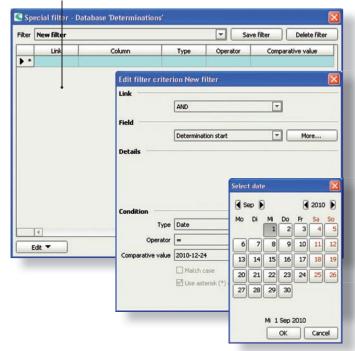
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Immediately recognize what matters

Get a quick overview in the results window. No long searching for the result – here you will find all the important raw data, results and calculation details in a nutshell.

Easy data management

Manage your data in the determination overview, where you can obtain the most important information about any sample in tabular and freely configurable form. Powerful search and filter tools provide support. Even a search for determinations by way of the serial number of individual instruments or dosing units is no problem for *tiamo*TM. Among thousands of titrations you are sure to find your own particular determination – in a matter of seconds.



If you wish to forward a result to your colleagues immediately, you can send it directly from the database by e-mail – without the hassle of prior saving and copying.

File name	
O Determination ID	
O Sample identification	ID1 💌
File name	Determination of Citric Acid

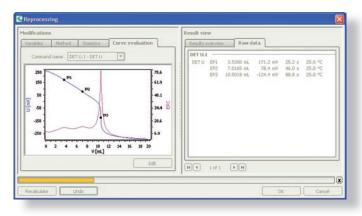
... that meets all your requirements



Determination reprocessing

Wrong sample weight? No problem. With the reprocessing function the sample weight can be quickly corrected or a calculation formula

adapted. Endpoint not recognized correctly? $tiamo^{TM}$ can help here as well. Just have the curve re-evaluated.





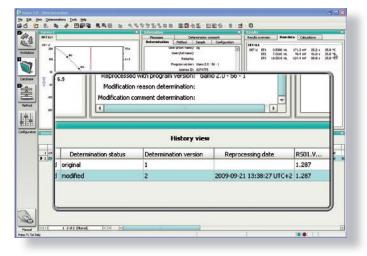
History

You do not have to worry about the documentation of your determinations. *tiamo*[™] manages every single version of a determination of a determination.

nation. The history function keeps you informed. The original version can be restored at any time – even that of imported determinations.

Signatures

You can add digital signatures to your determinations. **tiamo**TM offers signatures at two levels. As soon as a determination has been given a level 2 signature, the data are protected against any further alterations.

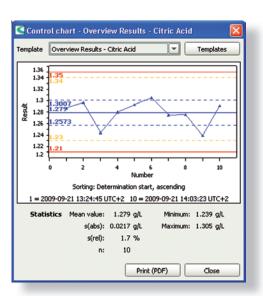




Control chart

*tiamo*TM can produce a control chart for your determinations at the touch of a button. Print it out, create a pdf document, or, using

copy-and-paste, include it directly in another, e.g. MS Office, application.



Data export

If you would like to process your data further are planning to connect *tiamo*™ to your LIM range of export formats is available, inclu modern XML format.

Your data, including measuring point lists, exported into all imaginable Office application bases and long-term archiving programs. You have more flexibility!

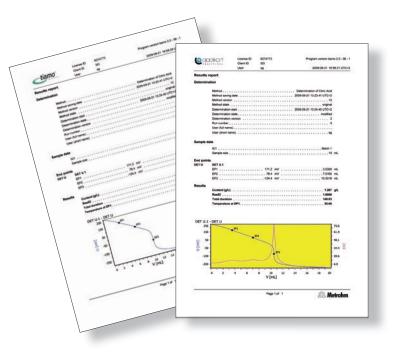
Export templates

▶ 1 CSV

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2 Kundenapplikation	*.mdet (tiamo format)	
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Report generator

The unique report generator allows you to customize the layout of your analytical reports just as you need it. To this end you can adapt one of the many report templates. There is no limit to what you can do; you can include any imaginable information in your $\textit{tiamo}^{\text{TM}}$ report. In order to generate an analysis report, you only need to mark the relevant determination in the database, select a report template and press «OK». You can also send your analytical reports directly and comfortably by e-mail!

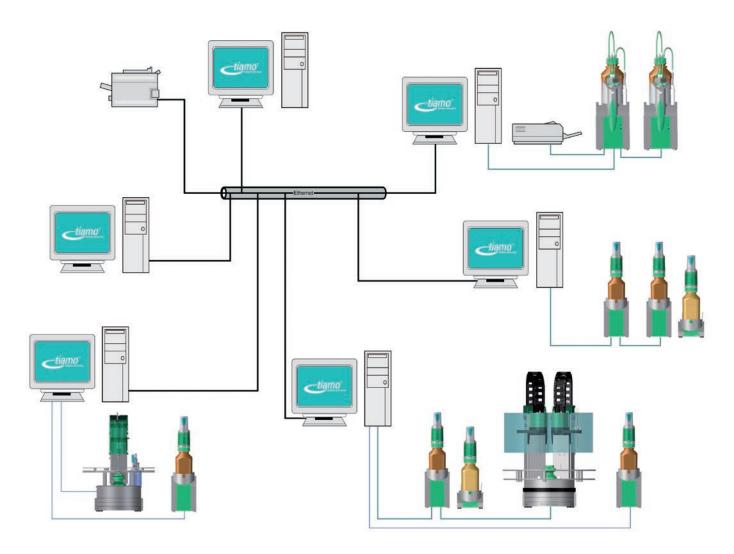


Intelligent client-server solutions – certainly, with *tiamo*[™] multi

Client/server database

tiamoTM enables central data administration by way of the client-server option. Even if you have implemented **tiamo**TM to run a single workstation, you can upgrade the software into a client-server system at any time to meet increasing requirements.

From now on you will administer your data centrally in your network – all determinations and methods will be stored on your server. They can be viewed and processed from all client PCs. Furthermore, all clients will access the same pool of methods.



Example of a client-server system comprising four lab workplaces and two office PCs

Data security

tiamo[™] supports you in safeguarding your data. If you activate the automatic backup function, **tiamo**[™] will automatically make complete copies of all determinations and configurations. This means that if the worst comes to the worst you can recover all your settings, system configurations and determinations within a very short time.

General	Access rights Backup Monitoring
Backu	p monitoring
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Nex	t backup 2009-10-22 01 🐳 : 00 🐳
	Interval 1 month
V cto	rt backup automatically
	Backup configuration data automatically Automatic backup Last backup 2009-09-22 17:09:43 UTC+2
_	Next backup 2009-10-22 06 🛫 : 00 🛫
	Interval 1 day(s)
	Backup directory Default backup directory

Central control

Thanks to modern user administration, you determine which data and functions should be available to which individual users. Thus, it is possible to set up the simplest interfaces with the necessary minimum functions according to the employee's task and function as well as interfaces with unrestricted functioning of all program parts.

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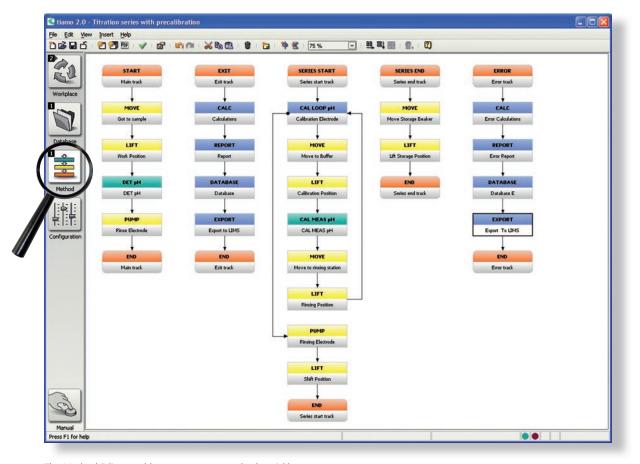
Customized interfaces: Example of a *tiamo*™ workplace reduced to minimum functions

Unlimited flexibility

Flexibility is one of the main advantages of this software package. You can arrange measuring commands, titrations, queries, calculations, database entries, export instructions and sample changer commands in any sequential order you want – according to the motto: «nothing is impossible».

Method editor

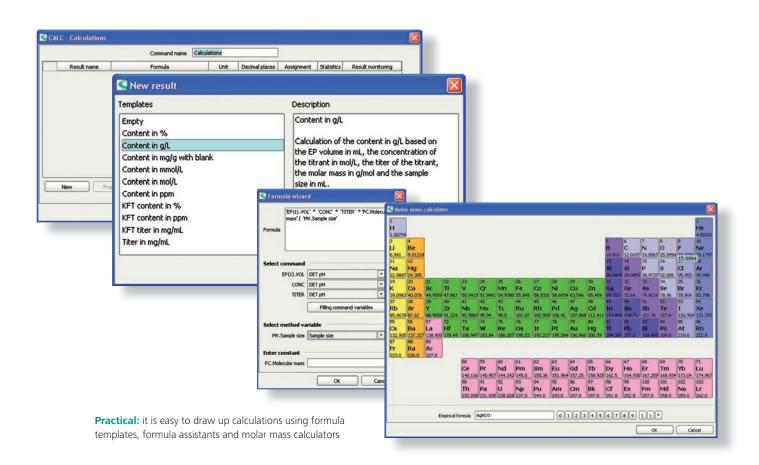
The block-by-block presentation of a method is clear and tidy. This makes operation perfectly easy. You just select what you need from the list of method templates provided, quickly insert a calculation template, add a report template and start the titration. It's as easy as that!



The Method Editor enables you to create methods quickly.

Quick access to details

The detailed parameters can be accessed quickly with a double-click on the particular method block.



Sending methods by e-mail

tiamoTM offers you the possibility to send a method directly from Method Management – e.g. to another laboratory. All that is needed is a click of the mouse and the method is ready for being sent in an e-mail template – without any prior exporting, saving and inserting.

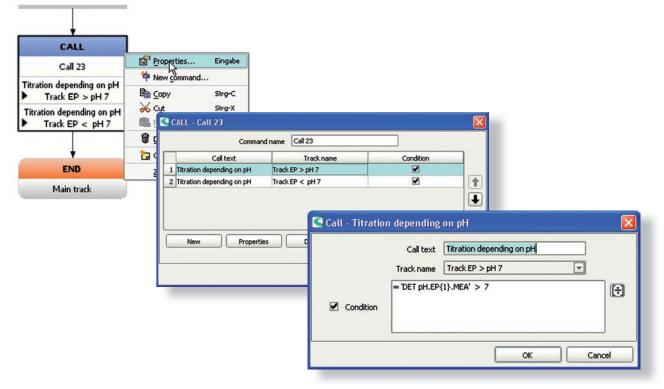
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	Name 🔺	Saved
▶ 1	Calibration 3 points	2009-09-21 1
2	Determination of Citric Acid	2009-09-21 1
3	Determination of HCI	2009-09-21 1
4	Titration series with precalibration	2009-09-23 1
5	Wasserbestimmung mit Titrant 2	2009-09-18 1-
6	Wasserbestimmung mit Titrant 5	2009-09-18 1
7	Waterdetermination with Titrant 2	2009-09-18 1
8	Waterdetermination with Titrant 5	2009-09-18 1
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Titration and more

In addition to the commands that are necessary to control the measuring, dosing, titrating and automation devices, *tiamo*[™] also lets you:

- show information on the screen to guide the user through a sample preparation procedure. Even hyperlinks can be displayed here, so you can refer a user to documents such as a SOP
- ask for sample sizes and monitor the limits of results
- assign results to different databases.

- print out result reports and send them by e-mail.
- inform your colleagues automatically by e-mail about any disruptions in the titration system.
- program recurring sequences by combining program steps in SEQUENCE commands.
- program decision-making trees and branches by calling up individual program parts in dependence on defined conditions – with the CALL command this can be done easily: a program part is only executed, if a defined condition is met.



Decision-making trees and branches: a sub-program is called up by way of a call command in dependence on conditions, here the pH value

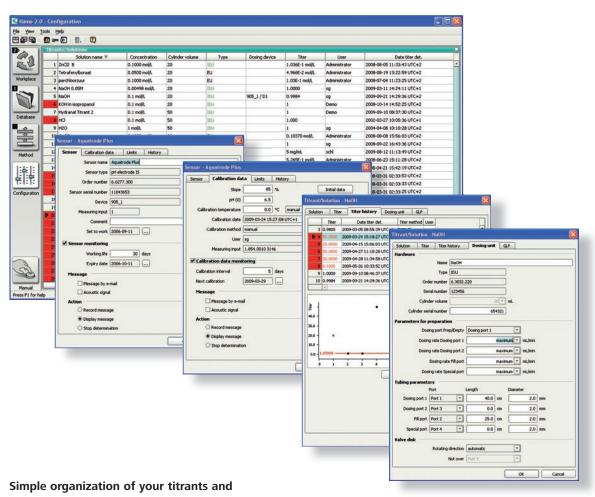
Further innovative features of *tiamo*[™]

Configuration

All the $\textit{tiamo}^{\text{TM}}$ settings are made in the configuration section.

Plug-and-play functionality

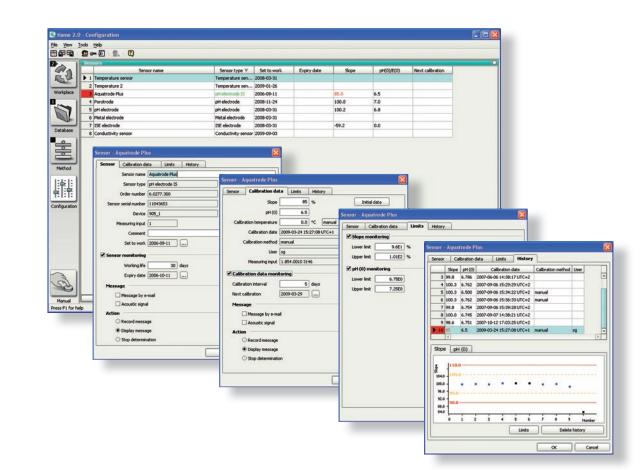
Our modern USB devices ensure that all connected instruments appear in the instrument window. Just plug them in and you areready to go! All instrument data are read in automatically.



solutions:

- In addition to the basic information, *tiamo*[™] manages all the data required for traceability.
- *tiamo*[™] even checks the working life and validity of titers for you.
- If you use our uniquely intelligent dosing systems with the new «Chip on board» technology, *tiamo*™ will prevent mix-ups.

Further innovative features of *tiamo*[™]



Sensor Organizer

tiamo[™] also manages your sensors. Thus you can ensure that all calibration intervals are observed and only properly functioning electrodes are used. The calibration history of each sensor is saved to ensure complete traceability.

If you use our intelligent electrodes with the iConnect, then just connect the electrode to the module – that's all! All the data saved on the electrode can be viewed in $tiamo^{TM}$. There is no danger of any mix-ups!

Safely managed

If a computer crash should occur, your system will be quickly ready for use again because all your configuration settings, methods and determination databases are saved by an automatic backup.

Backup directory	Default backup directory	-
Backup name	Backup-01	-
Backup date	2009-10-01 11:44:18 UTC+2	
Database name	ConfigDB	
Size	143247 KB	
Save as	ConfigDB	

Audit with *tiamo*[™] − sure!

tiamo[™] guarantees data security

Whether GMP or GLP rules, FDA or other QM regulations pertaining to the security of electronic data or the requirement that all results are traceable – $tiamo^{TM}$ has been developed from the very start to meet all these requirements.

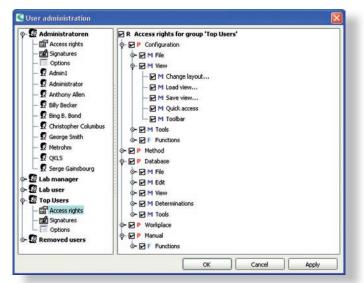
Security has priority

Protect your data with the comprehensive security functions of *tiamo*[™]. Let *tiamo*[™] or Windows monitor the passwords. Define the rules for assigning digital signatures and control access to your data.

Login/Password protection	Audit Trail/Modifications
Login policies	et
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🗹 Enforce login with password	
Password monitoring by tiamo	
O Password monitoring by Window	NS
Maximum number of login attempts	3 🜩
Message by e-mail E-ma	l
Logout policies	
New login only for same user	
No editing of workplaces in 'BUSY' s	tatus
Automatic logout after 10	min
Password policies	
Enforce unique password	
Enforce use of special characters	
Minimum password length 6	tharacters
Passwords expire every 3	55 days

User administration

Add new users to the list from your office computer – $tiamo^{TM}$ assists you in doing this. Arrange the access rights of each user in accordance with your company's security policy. $tiamo^{TM}$ sets no limits, but will convince you with its unique flexibility.



Audit with *tiamo*[™] − sure!

Complete Audit Trail

Each action performed by a *tiamo*[™] user is stored automatically in the Audit Trail. This means that you can obtain a detailed record of which employee performed what action at what point in time. Data for an audit can

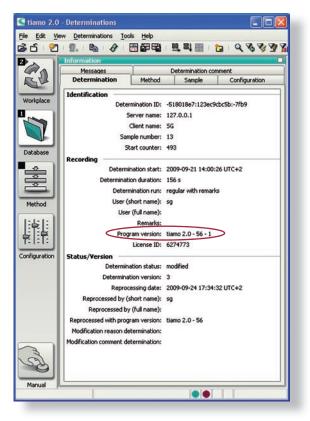
be prepared by pressing a button – from installation through to the last titration, from the start of the program through to the closing of the program.

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-	All entri							T
			1		at i			1
493	Type	Date ¥ 2009-09-21 13:24:45 UTC+2	User	Full name	Client	Category Workplace	Action Determination started	Method: "Determination of Citric Acid": Method version: "12":
494	Å	2009-09-21 13:24:05 UTC+2			SG	Workplace	Determination stopped	Method: "Determination of Citric Acid"; Method version: "12"; Method: "Determination of Citric Acid"; Method version: "12";
495	•	2009-09-21 13:23:51 UTC+2	-		SG	Workplace	Determination started	Method: "Determination of Citric Acid"; Method version: "12"; Method: "Determination of Citric Acid"; Method version: "12";
496	١	2009-09-21 13:23:41 UTC+2			SG	Methods	Method modified	Name: "Determination of Citric Acid"; Version: "12"; Group: "F
497	(i)	2009-09-21 13:25:37 UTC+2			SG	Workplace	Determination finished	Method: "Determination of Citric Acid"; Method version: "11";
498	(I)	2009-09-21 13:02:59 UTC+2		-	SG	Workplace	Determination started	Method: "Determination of Citric Acid"; Method version: "11"; Method: "Determination of Citric Acid"; Method version: "11";
499	Å	2009-09-21 13:02:56 UTC+2	-		SG	Database	Determination deleted	Determination ID: "-456f6b9e:123dbeefa1c:-7f84": Determin
500	(1)	2009-09-21 13:02:26 UTC+2 2009-09-21 13:02:26 UTC+2			SG	Methods	Method modified	Name: "Determination of Citric Acid"; Version: "11"; Group: "F
500	(I)	2009-09-21 13:02:26 UTC+2 2009-09-21 13:01:11 UTC+2			SG	Workplace	Determination finished	
501	Å	2009-09-21 13:01:11 UTC+2 2009-09-21 12:59:17 UTC+2	-	-	SG	Workplace	Parameter live modified	Method: "Determination of Citric Acid"; Method version: "9"; Method: "Determination of Citric Acid"; Method version: "9";
502	(1)	2009-09-21 12:59:17 UTC+2 2009-09-21 12:58:57 UTC+2			SG	Methods	Method modified	
503	1				SG		Determination started	Name: "Determination of Citric Acid"; Version: "10"; Group: "F
	Å	2009-09-21 12:58:31 UTC+2		-	1.2.2	Workplace		Method: "Determination of Citric Acid"; Method version: "9"; I
505	(I)	2009-09-21 11:40:58 UTC+2			SG	Workplace	Determination stopped	Method: "Determination of Citric Acid"; Method version: "9"; I
506	(I)	2009-09-21 11:40:51 UTC+2		-	SG	Methods	Method modified	Name: "Determination of HCI"; Version: "5"; Group: "Für den
507		2009-09-21 11:37:03 UTC+2	-		SG	Workplace	Determination started	Method: "Determination of Citric Acid"; Method version: "9";
508	•	2009-09-21 11:36:55 UTC+2	1.000		SG	Methods	Method modified	Name: "Determination of Citric Acid"; Version: "9"; Group: "Fi
509	0	2009-09-21 11:36:30 UTC+2		_	SG	Methods	Method modified	Name: "Determination of Citric Acid"; Version: "8"; Group: "Fi
510	8	2009-09-21 11:36:05 UTC+2			SG	Workplace	Start test error	Method: "Determination of Citric Acid"; Method version: "7";
511	•	2009-09-21 11:36:01 UTC+2			SG	Methods	Method modified	Name: "Determination of Citric Acid"; Version: "7"; Group: "Fi
512	8	2009-09-21 11:35:34 UTC+2			SG	Workplace	Start test error	Method: "Determination of Citric Acid"; Method version: "6";
513	Δ	2009-09-21 11:35:26 UTC+2		-	SG	Configuration	Solution modified manu	
514	8	2009-09-21 11:33:10 UTC+2			SG	Workplace	Start test error	Method: "Determination of Citric Acid"; Method version: "6";
515	•	2009-09-21 11:31:41 UTC+2	sg	_	SG	Methods	Method modified	Name: "Determination of Citric Acid"; Version: "6"; Group: "Fi
516	4	2009-09-21 11:29:19 UTC+2			SG	Login	Logged in	User: "sg";
517	٩	2009-09-21 11:29:19 UTC+2	sg		SG	Program	Program started	Program: "tiamo 2.0"; Build: "56";
518	٩	2009-09-21 11:28:33 UTC+2	AA	AA	SG	Program	Program finished	Program: "tiamo 2.0"; Build: "56";



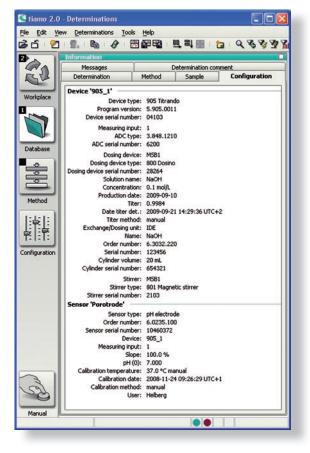
Version check

All data records are stored in **tiamo**TM together with their version. Protect your results against accidental or deliberate manipulation. Use the history function to show each version of your data. All alterations to electronic data are documented automatically – audits can no longer worry you.



Traceability

Be absolutely certain and place your confidence in the complete traceability of Metrohm software and hardware for your titrations. Each data record contains all the raw data necessary to ensure traceability. Unique in the world is the fact that each component used to generate the data is documented.





Ordering information

tiamo [™] is available in three different versions and offers a suitable system for every	application
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	tiamo ™ 2 light	tiamo ™ 2 full	tiamo ™ 2 multi		
Order number	The current order number can be found on our website.				
Max. number of devices per PC	2 ¹⁾	Unlimited	Unlimited		
Supported devices	See ²⁾	See ²⁾	See ²⁾		
Dialog languages	English, German ³⁾	English, German ³⁾	English, German ³⁾		
Meets the requirements of					
FDA 21 CFR Part 11		•	•		
User administration	•	•	•		
Security policy		•	•		
Audit Trail		•	•		
Client-server support			•		
Licenses	1	1	3		
Additional licenses (optional)			• 4)		
Data export to LIMS		•	•		
Parallel titration		•	•		
Upgrade available	•	•			

1) Please note that a balance or a barcode reader also counts as a connected device.

2)	
Titrando	808, 809, 835, 836, 841, 842, 854, 856, 857, 867, 888, 890, 901, 902, 904, 905, 906, 907
Titrino	702, 716, 718, 719, 720, 721, 736, 751, 758, 784, 785, 794, 795, 798, 799
Measuring	712, 856, 867
instruments	
KF Coulometers	756, 831, 851, 852
Sample changers	730, 774, 778, 789, 814, 815, 855, 864, 874
Others	846, 859, balances, barcode reader, Avantes spectrometer

- 3) Regular language updates in e.g. Chinese, French, Italian, Japanese, Polish. Portuguese, Russian, Slovakian and Traditional Chinese
- The current order numbers can be found on our website www.metrohm.com. The serial no. of the *tiamo*[™] multi version is required for ordering additional licenses!

License policy for the client-server version

Metrohm offers you a favorable license program. *tiamo*[™] multi uses runtime licenses, i.e. a license is only required for those *tiamo*[™] installations that are in use at the same time. In practice this means that you do not need to purchase a separate license for your office computer. When you have finished your measurements in the laboratory, you can continue to use *tiamo*[™] in your office without needing an additional license.

Regular updates!

tiamo[™] is constantly being extended, updated and the latest generation of Metrohm instruments is always being incorporated. If you decide to use *tiamo*[™] you will continue to benefit from new and extended versions of our software in the future and will always be right up-to-date in titration analysis.

System requirements

Minimum system requirements

Processor	Pentium 4; clock rate 1 GHz
Working memory	1 GB (Windows 2000/Windows XP) 2 GB (Windows Vista)
Free hard disk memory	500 MB for program
Free data memory	2 GB (for approx. 5000 determinations)
Operating system	Windows 2000 SP4, Windows XP Professional, Windows Vista, Windows 7
USB interface	for devices with USB interface
Serial interface	for devices with RS232 interface

Additional system requirements for *tiamo*[™] server

Data line	10 MBit/s, stable and permanent
	communication by means of TCP/IP
Operating system	Windows 2000 SP4, Windows XP Professional SP2, Windows 2000/2003 Server, Windows Vista
	Windows Vista





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