



Powerful titration systems

for a wide

range of applications

METTLER TOLEDO

DL53, DL55, DL58,

DL70ES, DL77

Automatic and Flexible DL5x and DL7x Titration Systems

METTLER TOLEDO



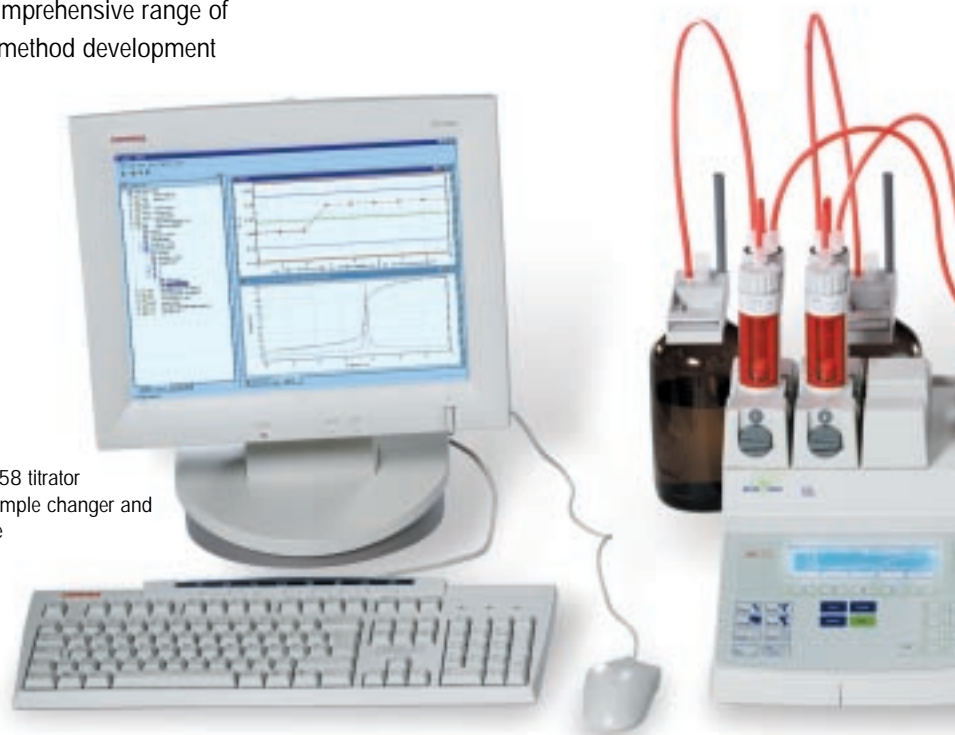
Automatic and flexible DL5x and DL7x titration systems

Titrate more professionally

Perfectly adapted for every application

With the METTLER TOLEDO DL5x and DL7x series titrators you can configure a titration system that is optimally adapted to your application and sample throughput requirements. The comprehensive range of system components as well as the powerful method development capabilities ensure that you always have the best possible instrument system available for your task.

METTLER TOLEDO DL58 titrator
with the Rondo 60 sample changer and
LabX titration software



Titrate more efficiently

Fully automated sample handling for the most varied needs

Automatic titration only saves you time if sample changing and sample preparation are fully automated. The DL5x and DL7x titrators can be combined with the sample changer best for the application. For up to 60 samples, from just a few ml up to five hundred ml, with solid, liquid or even sticky samples: the Rondo and Quanto sample changers offer the optimum solution for practically all applications.

Titrate more easily

Titrate more easily

Quick start thanks to simple operation and user guidance

What is the use of a perfect set of functions if the user cannot take advantage of them? The screen menus of the DL7x and DL5x titrators are logically structured with clear screen language. To make your daily work as easy as possible, no cryptic parameters or symbols have been used. User assistance is backed up by powerful features such as the learn titration, the built in sensor and titrant databases, and help systems.



Titrate with unsurpassed data handling

Titrate with unsurpassed data handling

PC Software included

Although METTLER TOLEDO titrators can master the most difficult applications without the need for a personal computer, the use of a PC nevertheless provides a number of important advantages. Besides the better overall view on the large PC screen, numerous new possibilities for evaluating and processing analytical data now become available, and the editing and management of methods is also appreciably easier. These are good reasons why every DL5x and DL7x titrator is supplied with the new LabX light titration software as standard. And if you need professional networking capability, and export and security functions, then LabX light's big brother, LabX professional, is the optimum solution.

Titrate with confidence

Titrate with confidence

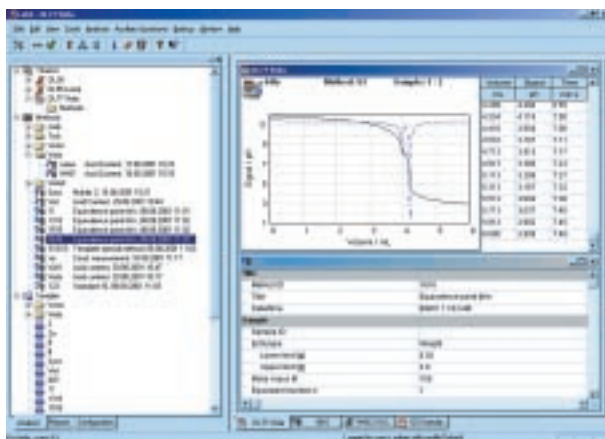
Perfect quality management and detailed documentation

The complete documentation of measurement results and the validation of methods and instruments are nowadays part of everyday life in the laboratory. The DL5x and DL7x titrators support you perfectly in this respect. Printouts include all the information required by GLP. The Titration Logbook helps you to perform successful instrument control and qualification. And if you store your data strictly according to FDA 21 CFR part 11 and want to process it further, then LabX professional provides the necessary functions.

Titration in research laboratories: the best tools for method development and docu



DL5x and DL7x titrators are ideal for use in research and development laboratories thanks to their extremely versatile method development capabilities and powerful PC software packages.



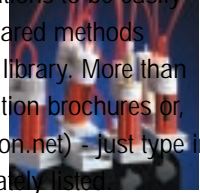
Complete overview on the PC

The large PC screen opens up new possibilities in titration. The LabX light software supplied with the titrator has been designed to provide an excellent overview at all times. It operates in a similar manner to widely-used standard software. All processes can be controlled from one single window. Many actions are performed with drag-and-drop features or with the right mouse button and are therefore very intuitive. LabX light runs so seamlessly and is so easy to use that you would hardly believe its tremendous resources: powerful method editor, sample series management, a wide range of statistical functions including control chart display, graphical re-evaluation and much more.

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Sophisticated methods

DL7x and DL5x titrator methods are based on a sequence of standard functions such as stirring, titrating, calculating and report creating. While the structure is preset for the DL55 and DL53, the DL58, DL70ES and DL77 allow the different functions to be flexibly arranged. This enables more complex method sequences such as multiple titrations to be easily performed. Users who prefer to make use of ready-prepared methods can take advantage of the very comprehensive method library. More than 350 methods are available either in the form of application brochures or, easier still, from a database on the Internet (www.titration.net) - just type in the application and the methods of interest are immediately listed.



www.titration.net

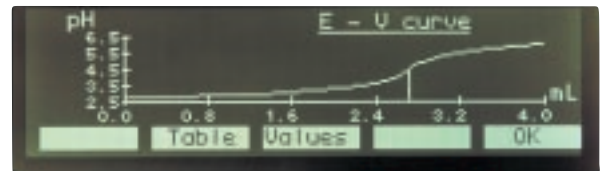


Numerous optimization possibilities

The DL5x and DL7x titrators offer many possibilities for controlling the addition of titrant and the detection of results. Dynamic titrant addition and four different data evaluation procedures are standard. The learn titration function allows rapid and automatic determination of the titration parameters.

Good feedback from the titrator

Whether you work directly with the titrator or via the PC software – you always have a clear overview of everything going on. For example, at any time during the titration you can display the titration curve, the current measurement value or a table of measured results.



Clear input

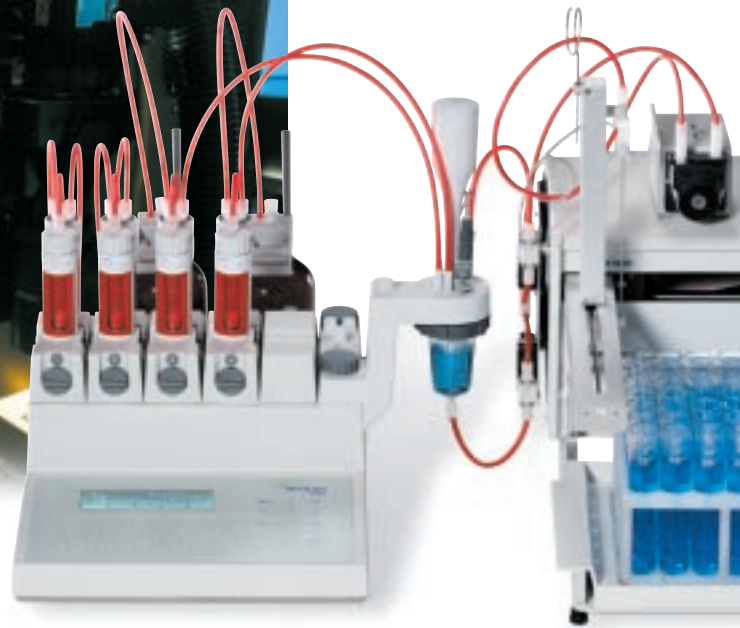
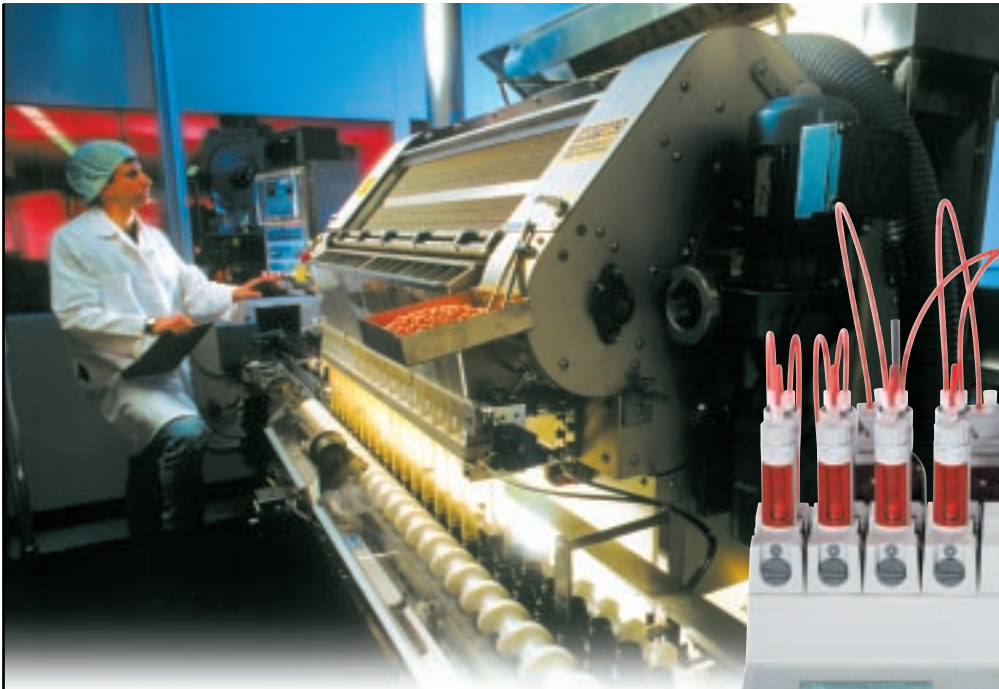
The entry of formulas and variables is easy with the built-in keyboard of the DL70ES and DL77 titrators. The DL5x titrators offer the same possibilities if a standard PC keyboard is connected.

Clear reports

The result printouts of the DL7x and DL5x titrators are not only very clear and well presented, they contain all the details required by GLP such as «How?, Where?, When? By whom? How much?». So that everything can be traced back 10 years later.



Important for near-process environments: high throughput and ease of use

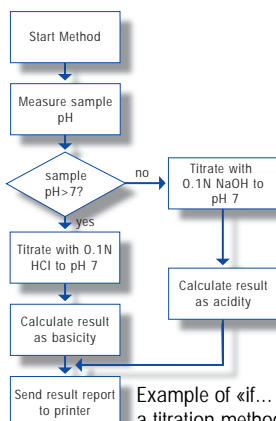


DL77 with Quanto aliquot

METTLER TOLEDO DL5x and DL7x titrators are not only easy to use, they can also be adapted with a comprehensive range of accessories to analytical situations where automation is essential. They are therefore ideal for quality control in near-process environments.

Plain language user interface

The user interface of the DL7x and DL5x titrators is designed for ease of use: The large display presents an excellent overview of all the possible commands and the instrument status; all menus and lists are displayed in plain language - 5 different languages can be selected; no abbreviations have been used; a help button explains complex functions. A special routine-mode allows user entries to be shortened and simplified.



Example of «if... then» functions in a titration method

Safety checks built in

With the DL77 and DL70ES numerous control procedures are possible. For example, to avoid weighing errors, sample weight range limits can be defined in the titration method. If the amount weighed-in falls below or exceeds the defined limits, then a message appears to warn the user. Thanks to «if.. then» functions, the instruments themselves can decide which functions are to be performed next or whether the results match the specifications.

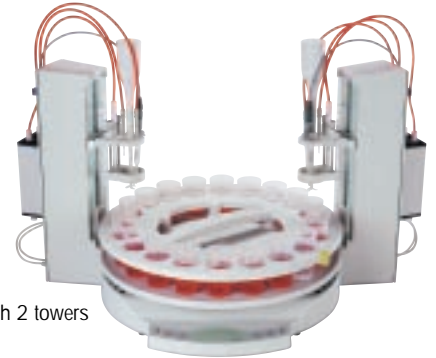


60 rack for Quanto

Highest throughput with Rondo and Quanto sample changers

The Rondo 60 is the best choice for small and medium sample series. In combination with a DL5x or DL7x titrator it offers the greatest flexibility: various racks allow the use of different sample containers; a second titration tower can be optionally used for parallel titration (with the DL77 titrator) or for sample preparation; different stirrers and pumps allow the system to be easily adapted to the individual requirements of the user. Upgrade kits are also available for the Karl Fischer titration as well as for COD determination.

The highest sample throughput is achieved when the DL77 and DL70ES titrators are combined with a Quanto sample changer. The system can then be used to perform sample preparation steps such as dilutions or the dissolution of solid samples.



Rondo 60 with 2 towers



Quanto aliquoting accessory

Fully automatic sampling

Quanto aliquot takes aliquots of liquids automatically. This greatly simplifies the measuring of large numbers of samples and eliminates practically all sources of error. All you have to do is to fill each sample tube with a minimum volume of sample.

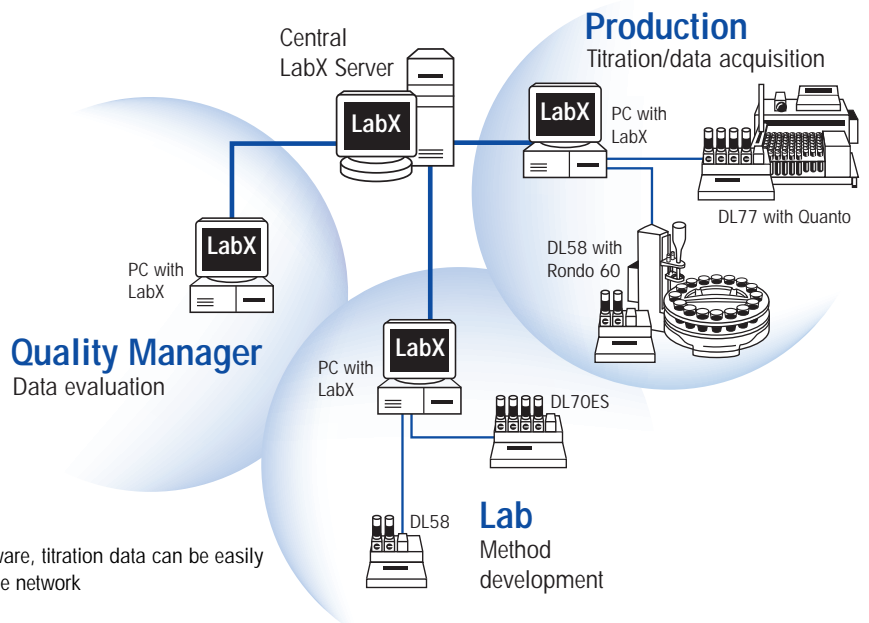
The instrument then adjusts the sample volume automatically to the amount required. In addition, METTLER TOLEDO titrators can also be expanded so that fully automatic sampling can be performed. This is done by equipping the titrators with the SU24 sampling unit.

The titrator controls everything

The DL5x and DL7x titrators have all the necessary outputs to control other instruments. The DL5x titrators can control up to 4 instruments, while DL7x titrators, when equipped with the corresponding accessory, can control up to 11 external devices.

Transparent data management via the network

The LabX software allows secure and reliable data storage in a PC. The data can also optionally be managed or automatically transferred to a laboratory information system (LIMS) via a central network server. Besides the actual measurement results, the method data can also be managed centrally. This means that all the titrators operating in a plant can be maintained at the same level. Simply modify the method on the server and it is immediately available to all the instruments on the network.



With LabX software, titration data can be easily managed via the network

Decisive for the QA/QC laboratory: optimum quality management and complete auto



A quality control laboratory usually has to deal with a large number of samples rapidly and absolutely reliably. In addition, validation and certification, and the documentation of results and their storage are subject to very strict guidelines. The combination of the DL7x and DL5x titrators with LabX software and the appropriate accessories allows you to easily meet these requirements.

GLP conform documentation

The user always has the choice as to how detailed he wants to print out the results. In any case the reports contain all the details required by GLP such as date, time, instrument used and user name.

Other items documented are:

- results, method name, sample data,
- table of measured values,
- titration curves including the first and second derivative,
- pH raw results,
- all the method parameters used, presented clearly and easy to read,
- list of methods, titrants and sensors as well as all the installation data.



DV705 titration stand on a DL58 titrator

Karl Fischer water determination included

The DV705 titration stand allows the DL5x and DL7x titrators to perform Karl Fischer water content determinations. With the DL53, DL55 and DL58 the titration stand can be directly mounted on the titrator thus saving valuable bench space.

Flexibility for the future

The DL55 and DL53 can be equipped with a plug-in module. This converts the DL53 to a DL55 or DL58, and the DL55 to a DL58.

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METTLER TOLEDO precision and reliability

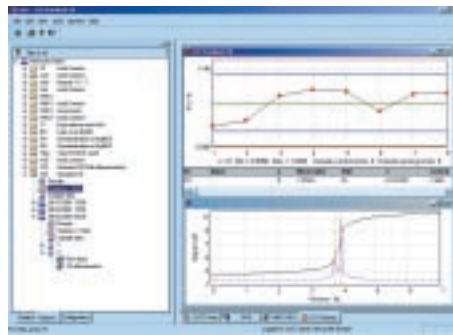
Every component of a METTLER TOLEDO titrator is manufactured according to the most stringent quality guidelines and is rigorously tested before use. With the Titration Logbook, the user has the ideal tool at hand for rapid and successful instrument qualification. In any titrator, the burette itself is of crucial importance and determines the quality of the results. METTLER TOLEDO uses a unique design of exceptional quality that allows burettes to be changed rapidly. The 4 types of burette available of 1, 5, 10 and 20 ml satisfy the stringent ISO 8655 standard for dispensing units. On request, METTLER TOLEDO provides an ISO/DIS certification service for the burettes in most countries.



Easy checking of results

The LabX light software supplied with the instrument makes it easy for you to perform comprehensive statistical analysis of results. Simply specify the data to be evaluated – e.g. all the results determined with the XY method in the last 4 weeks – and a control

chart with a graphical overview and statistical values is immediately displayed!



Control chart in LabX software

Audit trails with LabX professional

The LabX professional titration software provides numerous functions for fulfilling the requirements for digital data processing and storage according to FDA (21 CFR part 11): the powerful User Manager allows rights to be given selectively to different users. Every user has to log on to the system with a password. Any changes made and all the actions taken are recorded in an audit trail, a type of logbook, that can be only be accessed by authorized persons. But LabX not only allows methods and measurement data to be saved; there also is the unique possibility of making a

backup of the installation settings of the titrator. This makes it easy to bring several instruments up to the same level, or to quickly and easily reinstall a system if something untoward should happen.



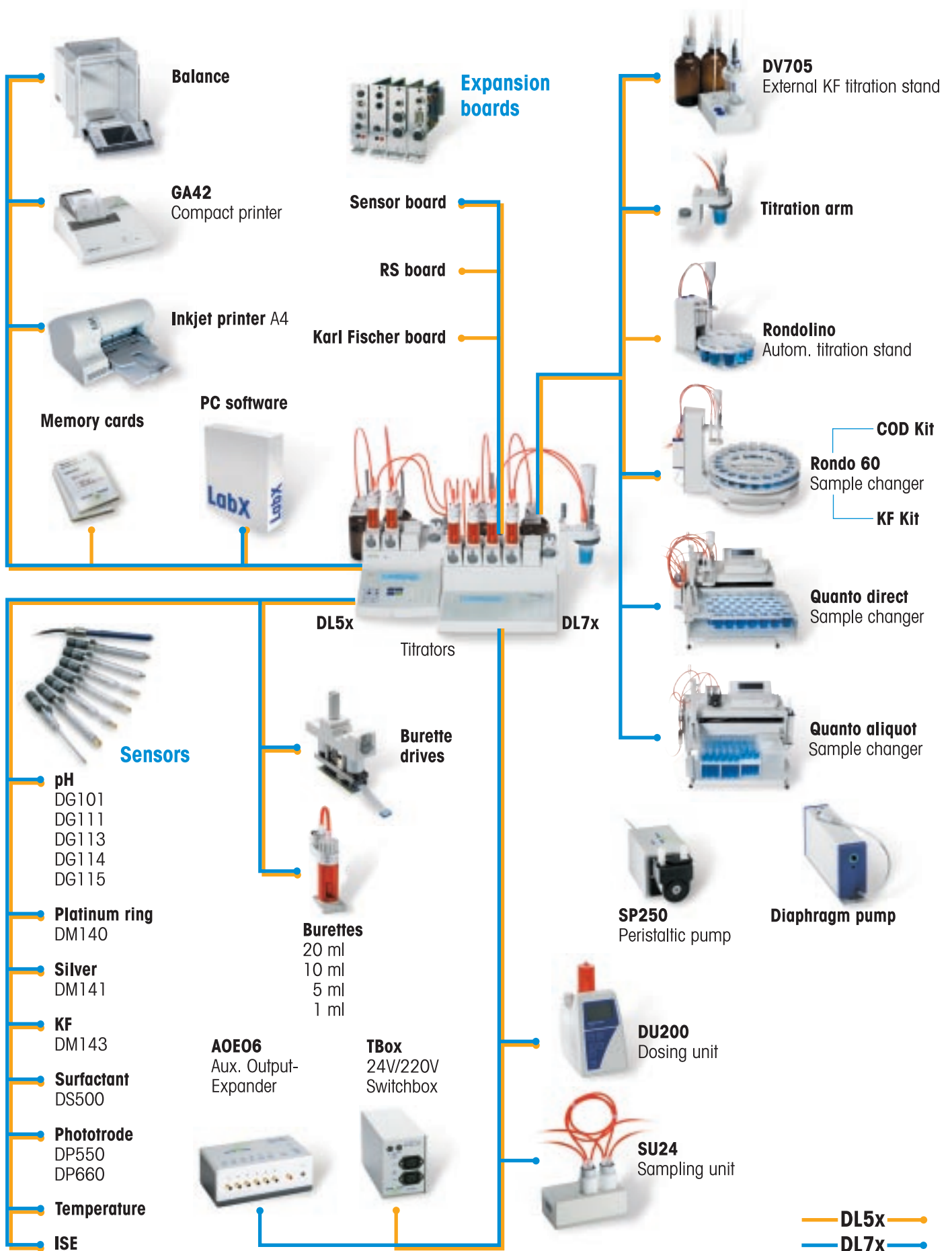
User Manager in LabX professional

The advantages of DL70ES and DL77:

- up to 4 burette drives avoids having to change burettes,
- more possibilities for method programming thanks to conditional functions and flexible method structure,
- connectability to the Quanto sample changer,
- ideal for the design of fully automated complex systems because up to 11 external devices can be controlled (in addition to standard accessories such as printers, balances, etc.),
- the linking of up to 10 methods and loops allow even more efficient working sequences,
- a double-size method memory as an option (100 methods with optional memory upgrade),
- two titrations can be performed simultaneously with the DL77,
- a full alphanumeric keyboard is already incorporated.

The DL5x/DL7x system

Overview of the most important system components



Features	DL53	DL55	DL58	DL70ES	DL77
Analysis type					
Acid/base, precipitation (Cl, Br, etc.), redox, complexometric and photometric titrations	•	•	•	•	•
pH stat, pH and ion selective direct measurement	•	•	•	•	•
Two phase titration			•		
Methods and databases					
Pre-defined METTLER TOLEDO methods for the most important applications	•	•	•	•	•
Method templates for creating user methods	20	30	30	20	20
Memory for user methods	ca. 50	ca. 50	ca. 50	ca. 100*	ca. 100*
Powerful, menu-guided method editor	•	•	•	•	•
Learn titration for the automatic optimization of the titration parameters used in the method	•	•	•	•	•
Flexible arrangement of the functions in methods			•	•	•
If...then decisions in methods				•	•
Selection lists for titrants and sensors	•	•	•	•	•
Method listing with up to 10 linked methods				•	•
Continuous methods				•	•
Express sample; can be inserted during the current series		•	•		•
Multitasking capability: during the current titration most of the other functions of the instrument can be controlled				•	•
Parallel titration of 2 samples					•
Control and evaluation					
End point titration (EP) with dynamic or continuous titrant addition	•	•	•	•	•
Equivalence point titration (EQP) with dynamic or incremental titrant addition.	•	•	•	•	•
Equilibrium or time increment controlled measurement	•	•	•	•	•
Five different curve evaluation procedures with EQP titrations: symmetric, asymmetric, segmented, min., max.	•	•	•	•	•
Predefined formulas for the most common calculations as well as freely definable calculation formulas	•	•	•	•	•
Number of calculations per method	3 (4)	3 (4)	12	12	12
Statistics for up to 60 samples: mean value, standard deviation and relative standard deviation	•	•	•	•	•
Display and user guidance					
Large backlit graphic display with online curve display	•	•	•	•	•
Alphanumeric entry with special characters, subscript and superscript	•	•	•	•	•
Built-in help function	•	•	•	•	•
Easily understandable menu guidance, selectable in English, German, French, Spanish or Italian	•	•	•	•	•
Soft-Keys for the rapid selection of commands	•	•	•		
Documentation					
GLP-conform printouts	•	•	•	•	•
Printout of titration curves	•	•	•	•	•
Dispensing					
Maximum number of burette drives	1	2	2	4	4
Exchangeable burettes	1, 5, 10, 20 ml				
Resolution	1/5 000 of the nominal volume				
Accuracy (with 10 ml burette)	0.2%				
Filling time	20s				
Additional functions					
Manual dispensing, stirring, pH value measurement, temperature measurement	•	•	•	•	•
Peripherals					
Maximum number of pH/mV sensor inputs	2(4)	2(4)	2(4)	4	4
Maximum number of temperature inputs	2(4)	2(4)	2(4)	2	2
Connections for the control of external devices	•	•	•	•	•
PC keyboard connectable	•	•	•		
Parallel printer connection	•	•	•	•	•
Serial connections (for printer, computer, Rondo 60)	2(3)	2(3)	2(3)	3	3
Balance connection for most commercially available laboratory balances	•	•	•	•	•
PC software					
LabX light titration: Control of the titrator, method editor, sample series editor, database with comprehensive post-evaluation and statistic functions.	standard				
LabX professional titration: as for LabX light, but additionally with comprehensive user management functions (password protection), audit trail, network capability (client-server) and export functions.	option				
Technical specifications					
Signal resolution	0.1 mV/0.002 pH				
Relative signal accuracy	+/- 0.1%				
pH range	+/- 27.6				
Voltage range	+/- 2000 mV				

* with upgrade

Standard equipment

DL53, DL55, DL58

- DL53, DL55 or DL58 titrator
- Overhead stirrer
- Electrode holder
- DV90 burette drive
- Sensor input
- Centronics interface with balance and parallel printer connections
- RS232 interface with two serial connections
- LabX light titration software
- Applications brochure with example applications for DL5x titrators
- Operating instructions incl. short version
- Printer cable
- Numerous small accessories

DL70ES

- DL70ES titrator with integrated serial connections and sensor inputs
- Overhead stirrer
- Electrode holder
- DV90 burette drive
- LabX light titration software
- Printer cable
- Operation instructions incl. short version
- Numerous small accessories

DL77

- DL70ES titrator with integrated serial connections and sensor inputs
- Overhead stirrer
- Electrode holder
- Two DV90 burette drives
- LabX light titration software
- Printer cable
- Operating instructions incl. short version
- Numerous small accessories

METTLER TOLEDO DL58 titrator
with Rondo 60 sample changer and
LabX titration software



AT	Mettler-Toledo GmbH, A-1100 Wien Tel. +43-1-604 19 80, Fax +43-1-604 28 80
AU	Mettler-Toledo Ltd., Port Melbourne, Victoria 3207 Tel. +61-3-9644 5700, Fax +61-3-9645 3935
BE	N.V. Mettler-Toledo s.a., B-1932 Zaventem Tel. + 32-2-334 02 11, Fax +32-2-334 03 34
CH	Mettler-Toledo (Schweiz) AG, CH-8606 Greifensee Tel. +41-1-944 45 45, Fax +41-1-944 45 10
CN	Mettler-Toledo (Shanghai) Ltd., Shanghai 200233 Tel. +86-21-6485 0435, Fax +86-21-6485 3351
CZ	Mettler-Toledo, spol. s.r.o., CZ-12000 Praha 2 Tel. +420-2-25 49 62, Fax +420-2-2424 7583
DE	Mettler-Toledo GmbH, D-35353 Giessen Tel. +49-6-41 50 70, Fax +49-6-41 507 128
DK	Mettler-Toledo A/S, DK-2600 Glostrup Tel. +45-4327 0800, Fax +45-4327 0828
ES	Mettler-Toledo S.A.E., E-08038 Barcelona Tel. +34-93-223 76 00, Fax +34-93-223 02 71
FR	Mettler-Toledo s.a., F-78222 Viroflay Tel. +33-1-3097 1717, Fax +33-1-3097 1616
HK	Mettler-Toledo (HK) Ltd., Kowloon Tel. +852-2744 1221, Fax +852-2744 6878
HR	Mettler-Toledo, d.o.o., HR-10000 Zagreb Tel. +385-1-230 41 47, Fax +385-1-233 63 17
HU	Mettler-Toledo, KFT, H-1139 Budapest Tel. +36-1-288 40 40, Fax +36-1-288 40 50
IT	Mettler-Toledo S.p.A., I-20026 Novate Milanese Tel. +39-2-333 321, Fax +39-2-356 29 73
JP	Mettler-Toledo K.K., Tokyo 143-0006 Tel. +81-3-5762-0606, Fax +81-3-5762-0756
KR	Mettler-Toledo (Korea) Ltd., Seoul (135-090) Tel. +82-2-518 20 04, Fax +82-2-518 08 13
KZ	Mettler-Toledo CA, 480009 Almaty Tel. +7-3272-608 834, Fax +7-3272-608 835
MY	Mettler-Toledo (M) Sdn, Bhd. 47301 Petaling Jaya Tel. +60-3-703 27 73, Fax +60-3-703 17 72
MY	Mettler-Toledo (S.E.A.), 47301 Petaling Jaya Tel. +60-3-704 17 73, Fax +60-3-703 17 72
MX	Mettler-Toledo S.A. de C.V., México C.P. 06430 Tel. +52-5-547 57 00, Fax +52-5-541 22 28
NL	Mettler-Toledo B.V., NL-4000 HA Tiel Tel. +31-3-4463 8363, Fax +31-3-4463 8390
PL	Mettler-Toledo, Sp. z o.o., PL-02-929 Warszawa Tel. +48-22-651 92 32, Fax +48-22-651 71 72
RU	Mettler-Toledo C.I.S. AG, 10 1000 Moscow Tel. +7-095-921 92 11, Fax +7-095-921 63 53
SE	Mettler-Toledo AB, S-12008 Stockholm Tel. +46-8-702 50 00, Fax +46-8-642 45 62
SG	Mettler-Toledo (S) Pte. Ltd., Singapore 139944 Tel. +65-7786 779, Fax +65-7786 639
SK	Mettler-Toledo, SK-82104 Bratislava Tel. +421-7-4342 7496, Fax +421-7-4333 7190
SI	Mettler-Toledo, d.o.o., SI-1236 Trzin Tel. +386-61-162 18 01, Fax +386-61-162 17 89
TH	Mettler-Toledo (Thailand) Ltd., Bangkok 10310 Tel. +66-2-719 64 80, Fax +66-2-719 64 79
TW	Mettler-Toledo Pac Rim AG, Taipei Tel. +886-2-2579 5955, Fax +886-2-2579 5977
UK	Mettler-Toledo Ltd., Leicester, LE4 1AW Tel. +44-116-235 70 70, Fax +44-116-236 63 99
US	Mettler-Toledo, Inc., Columbus, OH 43240 Tel. +1-614-438 4511, Fax +1-614-438-4900

For all other countries:

Mettler-Toledo GmbH
PO Box VI-400, CH-8606 Greifensee
Phone +41-1-944 22 11, Fax +41-1-944 31 70