

OPERATING INSTRUCTIONS



TitroLine[®] 7500 KF *trace*

TITRATOR

SI Analytics
a xylem brand

Gebrauchsanleitung Originalversion Seite 3 58

Wichtige Hinweise: Die Gebrauchsanleitung vor der ersten Inbetriebnahme des Titrators TitroLine® 7500 KF trace bitte sorgfältig lesen und beachten. Aus Sicherheitsgründen darf der Titrator TitroLine® 7500 KF trace ausschließlich nur für die in dieser Gebrauchsanleitung beschriebenen Zwecke eingesetzt werden.

Bitte beachten Sie auch die Gebrauchsanleitungen für die anzuschließenden Geräte.

Alle in dieser Gebrauchsanleitung enthaltenen Angaben sind zum Zeitpunkt der Drucklegung gültige Daten. Es können jedoch von SI Analytics sowohl aus technischen und kaufmännischen Gründen, als auch aus der Notwendigkeit heraus, gesetzliche Bestimmungen der verschiedenen Länder zu berücksichtigen, Ergänzungen am Titrator TitroLine® 7500 KF trace vorgenommen werden, ohne dass die beschriebenen Eigenschaften beeinflusst werden.

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Important notes: Before initial operation of the Titration Unit TitroLine® 7500 KF trace, please read and observe carefully the operating instructions. For safety reasons the Titration Unit TitroLine® 7500 KF trace may only be used for the purposes described in these present operating instructions.

Please also observe the operating instructions for the units to be connected.


All specifications in this instruction manual are guidance values which are valid at the time of printing. However, for technical or commercial reasons or in the necessity to comply with the statutory stipulations of various countries, SI Analytics may perform additions to the Titration Unit TitroLine® 7500 KF trace without changing the described properties.

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Notes to the Manual

The provided manual will allow you the proper and safe handling of the titration instruments.

The pictogram  has the following meaning:

For maximum security, observe the safety and warning instructions in the Instructions .
Warning of a general danger to personnel and equipment
Non-compliance may result in injury or material will be destroyed.

Status at time of printing

Advanced technology and the high quality of our products are guaranteed by a continuous development. This may result in differences between this operating manual and your product We can not exclude mistakes. We are sure you understand that no legal claims can be derived from the information, illustrations and descriptions.

Note

A potentially more recent version of this manual is available on our internet website at www.si-analytics.com .
The German version is the original version and binding in all specifications .

1 Technical Specifications of the Titrator TitroLine® 7500 KF trace

1.1 Summary

The TitroLine® 7500 KF trace is suitable for the following applications:

The possible range of titrations includes coulometric KF titrations with a maximum of 50 memorisable methods.

The TitroLine® 7500 KF trace can be used as stand-alone instrument or in combination with a heating oven.

General provisions:

The safety guidelines that are applicable to the handling of chemicals have to be observed under all circumstances. This applies in particular to inflammable and/or etching liquids.


Guarantee

We provide guarantee for the device described for two years from the date of purchase. This guarantee covers manufacturing faults being discovered within the mentioned period of two years. Claim under guarantee covers only the restoration of functionality, not any further claim for damages or financial loss.

Improper handling/use or illegitimate opening of the device results in loss of the guarantee rights. The guarantee does not cover the breach of glass parts. Also the delivered electrodes are excluded. To ascertain the guarantee liability, please return the instrument and proof of purchase together with the date of purchase freight paid or prepaid.

1.2 Specifications Titrator TitroLine® 7500 KF trace

Status Nov 21, 2013

CE sign:  EMC compatibility according to the Council Directive: 2004/108/EG;
applied harmonized standards: EN 61326-1:2006
Low-voltage directive according to the Council Directive 2006/95/EG
Testing basis EN 61 010, Part 1

ETL sign:



Conforms to ANSI/ UL Std. IEC 61010-1
Certified to CAN/ CSA Std. C22.2 No. 61010-1

Country of origin: Germany, Made in Germany

Measurement input: Karl-Fischer (Dead-stop) connector for double platinum electrode
Connector: 2 x 4 mm - sockets.

	Measurement range	Display resolution	Measurement accuracy* without sensor probe
I [μ A]	0 ... 100	0,1	0,2 \pm 1 Digit

* The measurement uncertainty of the sensor probe has to be taken into account as well

Solutions to be used:

All common and modern Karl-Fischer reagents can be used for the coulometry process.

Display: 3.5 inches -1/4 VGA TFT display with 320x240 pixels.

Electrode inputs: input for double platinum electrode, 2 x 4 mm sockets, colour blue
Input for generator electrode, 2 x 4 mm sockets, colours green and black

Power supply: power supply 90-240 V; 50/60 Hz, power input: 30 VA
Use the Power supply TZ 1853, Type No.: FW 7362M/12 only!

RS-232-C Interface: RS-232-C interface separated galvanically through photocoupler
Daisy Chain function available.

Data bits: adjustable, 7 or **8** Bit (default: 8 Bit)

Stop bit: adjustable, **1** or 2 Bit (default: 1 Bit)

Start bit: static **1** Bit

Parity: adjustable: even / odd / **none**

Baud rate: adjustable: 1200, 2400, **4800**, 9600, 19200 (Default 4800 baud)

Address: adjustable, (0 to 15, default: 01)

RS-232-1 for computer, input Daisy Chain

RS-232-2 devices of SI Analytics, titrator TitroLine® 6000/7000/7500,
- Burettes TITRONIC® 500, TITRONIC® 110 *plus*, TITRONIC® *universal*,
- Balances of the types Mettler, Sartorius, Kern, Ohaus
(for other types please contact SI Analytics)
- Exit Daisy Chain

USB Interface: 2 x USB-type A and 1 x USB-type B

USB –Typ B (“slave”) for connecting a PC

USB –Typ A (“master“)	for connecting: - USB keyboard - USB printer - USB data media e.g. USB stick - USB Hub
Stirrer connection:	12V DC out, 500mA power supply for stirrer TM 235 or titration stand TM 235 KF
Housing material:	Polypropylene
Front keyboard:	Polyester coated
Housing dimensions:	15.3 x 18 x 29.6 cm (W x H x D)
Weight:	ca. 2.2 kg for basic unit without stirrer TM 235 or TM 235 KF titration stand
Ambient conditions:	Ambient temperature: + 10 ... + 40 °C for operation and storage Humidity according to EN 61 010, Part 1: Max. relative humidity 80 % for temperatures up to 31 °C, linear decrease down to 50 % relative humidity at a temperature of 40 °

Software

Measuring range	10 µg – 100 mg / 1 ppm – 5 % (recommended)
Measuring speed	Max. 1.5 mg/min
Number methods:	50
Conditioning	Automatically with drift determination
End point criteria	Drift, stop drift tolerance, min. and maximum titration time
Auto start	Yes, after sample allowance
Statistics	Mean value, standard deviation and relative standard deviation
Curve printout	Measuring unit/time
Documentation	GLP compliant on printer or in PDF format (USB- memory stick)

Specifications**Titration Stand TM 235 KF**

Status Nov 21. 2013

In connection with the titrator TitroLine 7500 KF trace

CE - Mark **CE**

EMV – compatibility according to Council Directive 89/336/EWG;
 Transient emissions according to norm EN 50 081, part 1
 Interference resistance according to norm EN 50 082, part 2
 Low voltage directive according to Council Directive 73/23/EWG
 Last amended by directive 93/68/EWG; test criteria EN 61 010, part 1

ETL sign:

Conforms to ANSI/ UL Std. IEC 61010-1
 Certified to CAN/ CSA Std. C22.2 No. 61010-1

Country of origin:

Germany / made in Germany

Pump:

Free volume flow - air-: flow rate 2.25 l / min
 Delivery pressure max. 1.5 bar
 Flow rate liquid medium ca. 0,8 l / min

Stirring speed:

50 ... 1000 U/min

Hoses:

PVC- hose, outer diameter 6 x 1 mm
 PTFE- hose, outer diameter 4 x 0.5 mm

Connections

Power supply (top)::

Low voltage input 12 V / – on the backside of titration stand
 Plug connection: plug for low voltage connection – phone jack-,
 Positive pole at pin contact, inside contact $\varnothing = 2,1$ mm, USA/Japan,
 Power supply via titrator TitroLine 7500 KF trace
 Use the Power supply TZ 1855, Type No.: FW 7555o/12 only!

Housing

Material:

Polypropylene;

Dimensions:

80 x 130 x 250 mm, H x W x D (height without stand rod)

Weight:

1.0 kg

Ambient conditions:

Not suitable for explosive environments!

Climate:

Ambient temperature: + 10 °C ... + 40 °C for storage and transport.
 Humidity: According to EN 61 010, part 1:
 Maximum relative humidity 80 % for temperatures up to
 31 °C,
 Linearly decreasing up to 50 % relative humidity
 With a temperature of 40 °C

1.3 Warning and safety information

The TitroLine® 7500 KF trace corresponds to protection class III. It was manufactured and tested according to DIN EN 61 010, Part 1, Protective Measures for Electronic Measurement Devices and has left the factory in an impeccable condition as concerns safety technology. In order to maintain this condition and to ensure safe operation, the user should observe the notes and warning information contained in the present operating instructions. Development and production is done within a system which meets the requirements laid down in the DIN EN ISO 9001 standard.

For reasons of safety, the titrator TitroLine® 7500 KF trace must be opened by authorised persons only; this means, for instance, that work on electrical equipment must only be performed by qualified specialists.

⚠ In the case of nonobservance of these provisions the titrator TitroLine® 7500 KF trace may constitute a danger: electrical accidents of persons or fire hazard. Moreover, in the case of unauthorised intervention in the titrator TitroLine® 7500 KF trace as well as in the case of negligently or deliberately caused damage, the warranty will become void. ⚠

Prior to switching the device on it has to be ensured that the operating voltage of the titrator TitroLine® 7500 KF trace matches the mains voltage. The operating voltage is indicated on the specification plate. Nonobservance of this provision may result in damage to the titrator TitroLine® 7500 KF trace or in personal injury or damage to property.

If it has to be assumed that safe operation is impossible, the titrator TitroLine® 7500 KF trace has to be put out of operation and secured against inadvertent putting to operation. In this case please switch the titrator TitroLine® 7500 KF trace off, pull plug of the mains cable out of the mains socket, and remove the titrator TitroLine® 7500 KF trace from the place of work.

Examples for the assumption that a safe operation is no longer possible,

- ☞ the package is damaged,
- ☞ the titrator TitroLine® 7500 KF trace shows visible damages,
- ☞ titrator TitroLine® 7500 KF trace does not function properly,
- ☞ liquid has penetrated into the casing.

The titrator TitroLine® 7500 KF trace must not be stored or operated in humid rooms.

For reasons of safety, the titrator TitroLine® 7500 KF trace must only be used for the range of application described in the present operating instructions.

In the case of deviations from the intended proper use of the device, it is up to the user to evaluate the occurring risks.

⚠ The relevant regulations regarding the handling of the substances used have to be observed: The Decree on Hazardous Matters, the Chemicals Act, and the rules and information of the chemicals trade. It has to be ensured on the side of the user that the persons entrusted with the use of the titrator TitroLine® 7500 KF trace are experts in the handling of substances used in the environment and in titrator TitroLine® 7500 KF trace or that they are supervised by specialised persons, respectively.

During all work with titration solutions: **⚠ Please wear protective glasses! ⚠**

The titrator TitroLine® 7500 KF trace is equipped with integrated circuits (EPROMs). X rays or other high energy radiation may penetrate through the device's casing and delete the program.

Please refer also to chapter 8 "Maintenance and Care of the titrator TitroLine® 7500 KF trace.

2 Unpacking and First Operation

2.1 Unpacking

The titrator itself as well as all related accessory and peripheral parts have been carefully checked at the factory to ensure their correct function and size.

. The different TitroLine® 7500 KF trace modules consists of:

- TitroLine® 7500 KF trace basic unit including keyboard, stand rod TZ 1748 and retaining clamp TZ 1749 and power supply.
- Electrode KF 1150
- KF starter kit TZ 1789 with molecular sieve, glass wool and a set of syringes with needles
- **For module 1 and 3 only:** Magnetic stirrer TM 235 and titration vessel TZ 1751
- **For module 2 and 4 only:** KF titration stand (pump and stirrer) TM 235 KF including waste (1 L clear bottle), solvent (1 L amber bottle) and moisture bottle (100 ml) with all tubes. Titration vessel TZ 1754
- **For module 1 and 2:** Generator electrode TZ 1752 without diaphragm
- **For module 3 and 4:** Generator electrode TZ 1753 with diaphragm

Please ensure that the small accessories are also removed in full from the packaging. The next images show the content of module 1 or 3 (with magnetic stirrer):



Fig. 1

2.2 Connection and installation of titrator and magnetic stirrer TM 235

The low voltage cable of the power supply TZ 1853 has to be plugged in to the 12 V socket „in“, (see Fig. 12 back panel, chapter. 2.7), on the back panel of the titrator. Then plug the power supply into the plug socket.

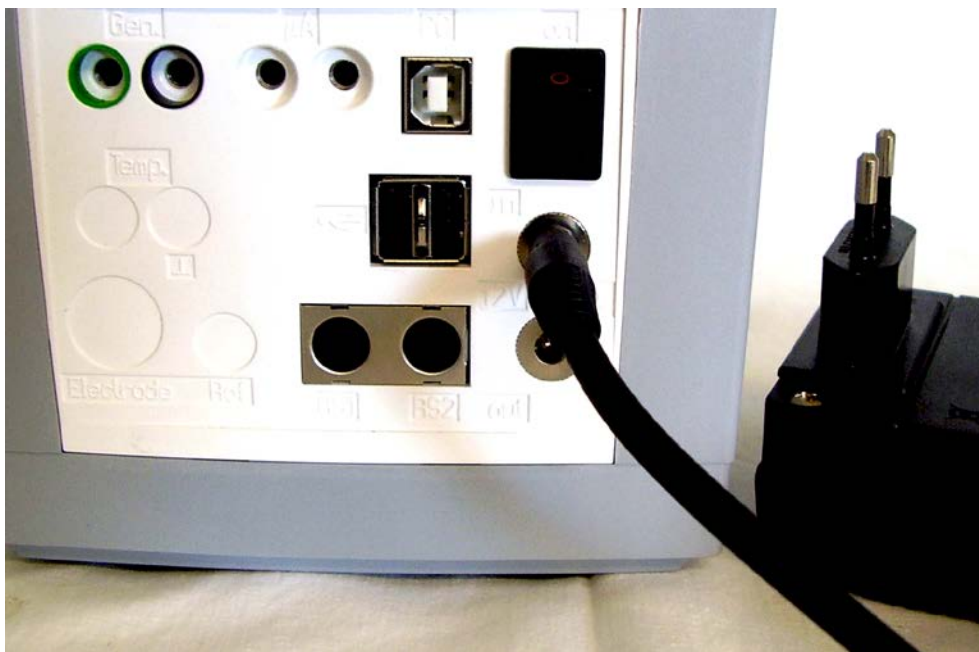


Fig. 2a

Place the power supply easily accessible in order to be able to remove the titrator anytime easily from the power circuit.

As a rule, the TM 235 magnetic stirrer is arranged to the right of the piston burette. The magnetic stirrer is connected to the 12V **out**-socket in the rear panel of the piston burette using the TZ 1577 connection cable (scope of delivery of the basic device) (cp. 'Back panel' illustration, chapter 2.4). The stand rod (scope of delivery of the basic device) is screwed into the thread; subsequently the Z 305 titration clamp (scope of delivery of the basic device) is installed (fig. 2b).



Fig. 2b

2.3 Installation with magnetic stirrer TM 235 (module 1 and 3)

The titrator TitroLine 7500 KF trace can be mounted on any desired plain basis. Prior to inserting the mains plug, it must be ensured that the operating voltage of the titrator complies with the mains voltage. Normally, this should not be a problem since the power pack is designed as a multiple voltage level power pack with a range of 100 – 240 V. Depending on the power socket, the EURO-plug or the US-plug must be connected to the power pack. UK- and Australian plugs adaptor are available on demand.

⚠ The titrator TitroLine 7500 KF trace may not be used in explosive environments. ⚠

As a rule, the TM 235 magnetic stirrer arranged to the right of the titrator.



Fig. 3

Screw the stand rod into the provided nut of the magnetic stirrer



Fig. 3a

Mount the retaining clip onto the stand rod



Fig. 4

Clamp the titration vessel onto the retaining clip. Fix the titration vessel in such a way that the bottom of the titration vessel stands directly at the upper surface of the magnetic stirrer:



Fig. 5

Put the indicator electrode KF 1150 and the generator electrode (TZ 1752 or TZ 1753) into the provided openings NS 7,5 and NS 19 and the electrode cables into the colour-coded socket. The indicator electrode has a fixed cable with 2 blue plugs. The cable LB 04 NN has a green and black plug and is connected to the provided port of the generator electrode.

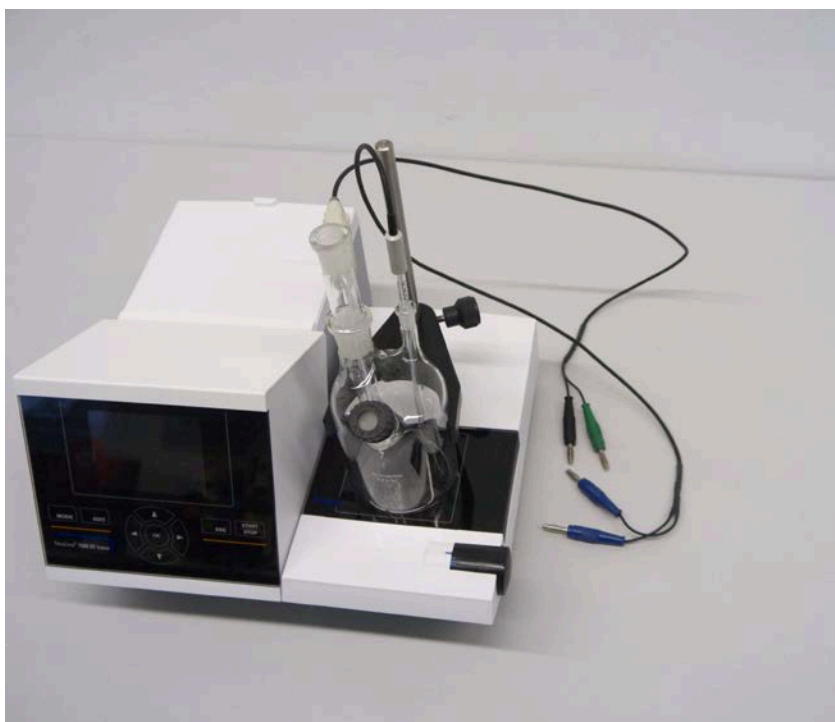


Fig. 6

2.4 Installation with magnetic stirrer/pump TM 235 KF (module 2 and 4)

As a rule, the TM 235 KF magnetic stirrer/pump is arranged to the right of the titrator (see fig. 2). Clamp the titration vessel TZ 1754 onto the retaining clip. Fix the titration vessel in such a way that the bottom of the titration vessel stands directly at the upper surface of the magnetic stirrer:



Fig. 7

Put all white inner plastic adapters to the waste, solvent and moisture bottle. Fill the moisture bottle with molecular sieve. Connect the PVC and PTFE plastic tubes as shown in the next pictures.

The PVC tubes are connected to the connectors at the back side of the TM 235 KF. The long PVC tube is used for the connection of the waste bottle. The two shorter PVC ones are used to connect the moisture bottle and the solvent bottle. The moisture bottle is connected to the right connector (view from above) of the TM 235 KF. The waste (clear) bottle is connected to the left connector.

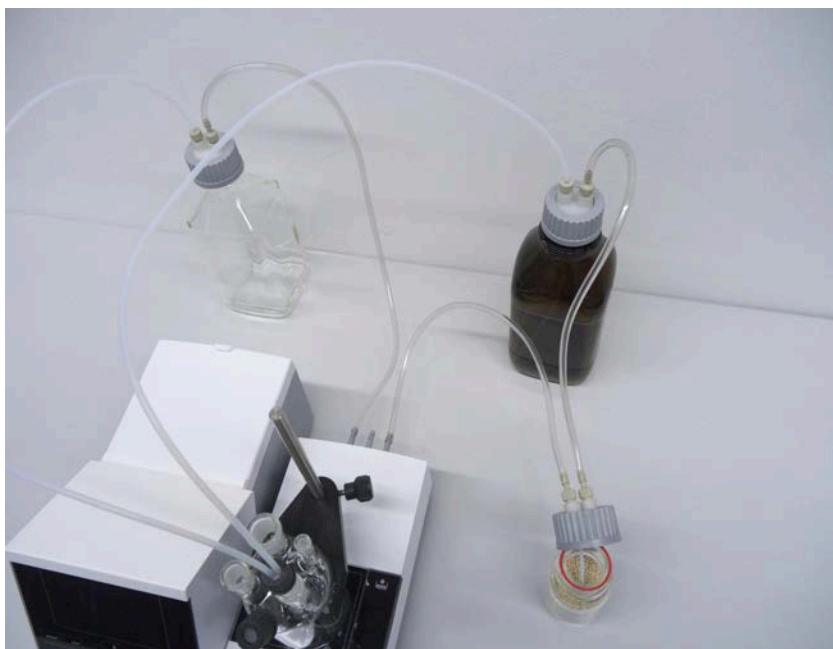


Fig. 8

Put the threaded pipe with the NS 14/23 core and the GL 14-thread in one of the NS-14.5-openings. Put both PTFE-tubes through both bore holes of the septum. The PTFE tube from the clear waste bottle is adjusted to the bottom of the titration vessel (tube 1). Put the PTFE tube from the solvent bottle (tube 2) is adjusted as shown in the next two pictures:



Fig. 9

Put the other end of the PTFE-tube, which touches the bottom of the titration vessel (tube 1), through the opening on the cap of the clear square bottle (-> waste bottle). Put the other PTFE tube (tube 2) through the opening of the cap of the brown reagent bottle. Adjust the dosage and the disposal tubes as depicted in **Fig. 10**. Then seize the screwing with the tubes on the bottles

Put the indicator electrode KF 1150 and the generator electrode (TZ 1752 or TZ 1753) into the provided openings NS 7,5 and NS 19 and the electrode cables into the colour-coded socket. The indicator electrode has a fixed cable with 2 blue plugs. The cable LB 04 NN has a green and black plug and is connected to the provided port of the generator electrode. The keyboard is connected to one of the USB –A ports.

The keyboard is connected to to one of the USB –A (host) ports.

Connect the titration stand or magnetic stirrer and the titrator with the provided low voltage cable TZ 1577.

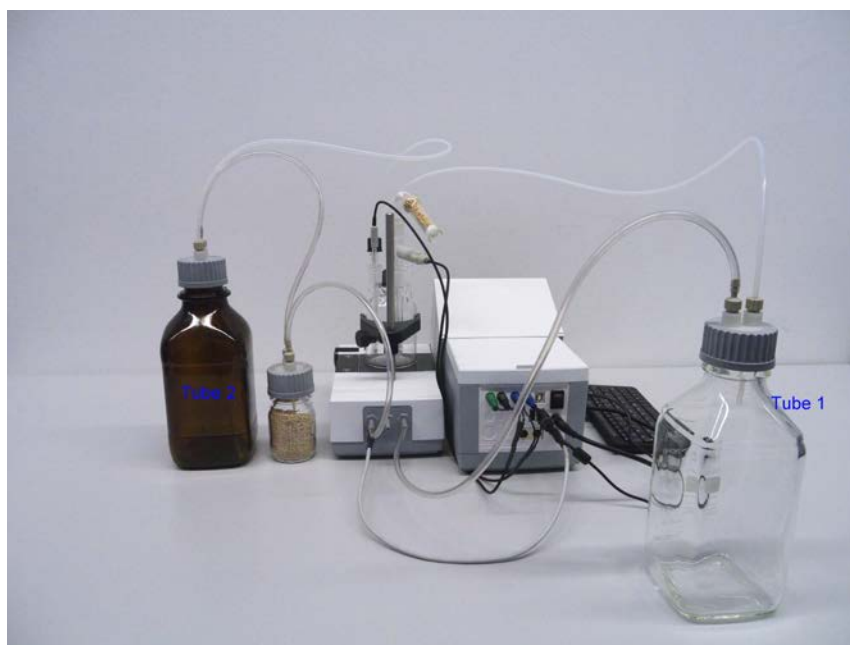


Fig. 10

Fill the KF analyte into the brown 1 l-reagent bottle. You can also connect the GL 45 adaptor directly to the analyte bottle (recommended) if it has a GL-45 –thread.

Working with the titration stand

- Dosage: Pump the analyte into the titration vessel by pressing the front part of the rocker switch. As long as you press the button the dosing process proceeds.
- Siphon off: Siphon off the solution from the titration vessel by pressing the back part of the rocker switch. As long as you press the button it will be siphoned off.

Note: Mind the fill level of the waste bottle. Before you siphon off the titrating solution please make sure that the disposal bottle can absorb this amount of solution.

The built-in magnetic stirrer stirs the liquids in the titration vessel. You can adjust the stirring speed at the turning knob at the right upper side of the titration stand or magnetic stirrer.

Troubles

Problems might occur if the tubes are not connected properly or the pressure / low pressure system has a leakage. Then, after a few seconds operating time of the pump, no reagents will be conveyed anymore. When checking the tubes please observe that the bottle screwing and all adaptors are leak-proof. The same applies to the tube connections of the drying bottle.

Note: Buckled tubes cause incorrect dosages and also the siphon off process does not work properly. Please check the tubes and their connections for leak-tightness on a regular basis. Replace if necessary.

If the reagents continue to run in from the storage bottle after the actual dosage process has ended, position the bottle at lower level than the titration vessel. If the reagents continue to run in from the storage bottle between the dosage process and the siphon off process, please wait a few seconds between the changes.

We recommend to remove the glass adaptor with the dosing and exhaust hose after adding the KF-analyte and to close the ground-in opening with the provided die glass stopper NS 14.5.

2.5 Filling the Titration Vessel

Fill the titration vessel approx. up to a half with analyte that are suitable for the respective application using a funnel (Module 1 and 3). You can even use the pump for modules 2 and 4. If you use a generator electrode with diaphragm (included in delivery with module 3 and 4), it is necessary to fill an ampoule with catholyte into the generator electrode. Here, please use a syringe with needle:



Fig. 11

2.6 Switch on Device, First Conditioning

Set the stirring speed at the TM 235/TM 235 KF to achieve an efficient stirring without creating air bubbles. Don't forget magnetic stirring bar!. Now switch on the device. The mains switch is situated on the left at the back side of the TitroLine 7500 KF Trace. As soon it is turned on the TitroLine 7500 KF trace starts the conditioning process. If the analyte has freshly been filled in, the conditioning can take up to 10-20 minutes for generator electrodes without frit and sometimes a few hours for generator electrodes with frit. The drift display is then $> 1500 \mu\text{g}/\text{min}$. If the drift has fallen $< 10 \mu\text{g}/\text{min}$, the TitroLine 7500 KF trace is ready for first measurements.

2.7 Connecting the Titrator - Combination with Accessories and Additional Devices

2.7.1 Back panel of the titrator TitroLine® 7500 KF trace

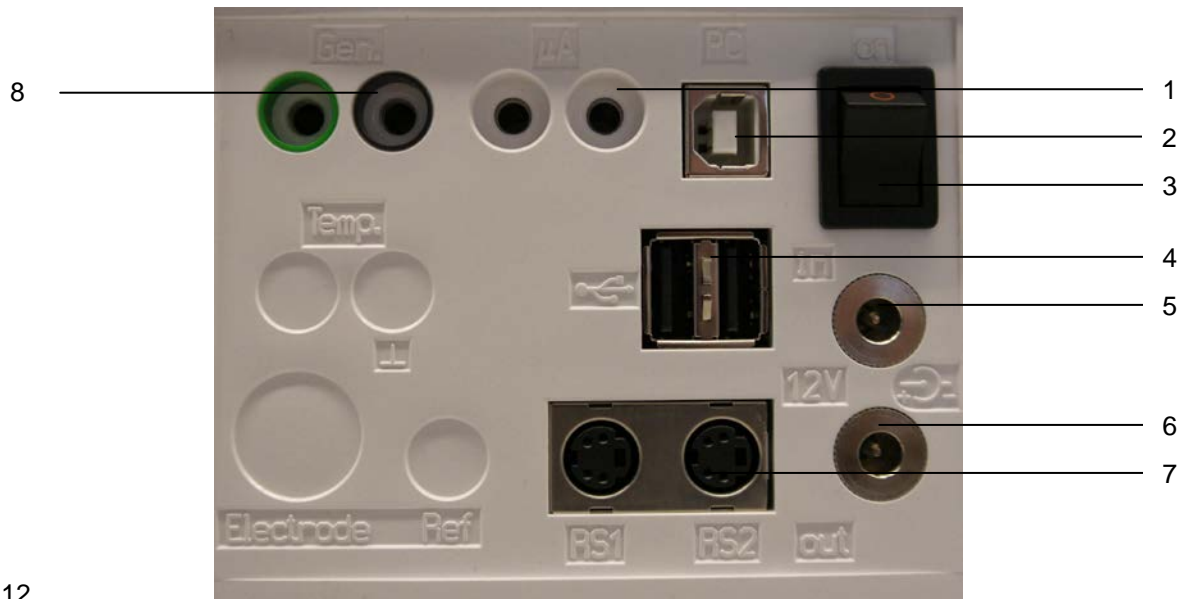


Fig. 12

2.7.2 Connection ports of the TitroLine® 7500 KF trace

The TitroLine® 7500 KF trace is equipped with the following connections:

- 1) μA measurement input for the connection of double platinum electrodes (KF 1100 or Pt 1200, Pt 1400)
- 2) USB-B interface for connection to a PC
- 3) On/Off switch
- 4) Two USB-A ("Master") interfaces for connecting USB devices such as a keyboard, printer, manual control unit, USB memory device etc.
- 5) "in": Connection of the external power pack
- 6) "out": Connection of the TM 235 KF titration stand or TM 235 magnetic stirrer
- 7) Two RS232 ports, 4-channel (Mini-DIN):
RS1 for connection to the PC
RS2 for connection of a weighing balance and other devices from SI Analytics
- 8) Inputs for the generator electrode, coloured green and black

2.7.3 Connecting a printer

Printers with a USB interface are to be connected to one of the two USB-A interfaces. These printers **have to** feature HP PCL emulation (3, 3GUI, 3 enhanced, 5, 5e). So-called GDI printers cannot be used! Alternatively the thermo-compact printer Seiko S445 can be connected.

2.7.4 Connecting a USB device (manual controller, keyboard, memory device, hub)

The following USB devices can be connected to the USB-A interfaces:

- PC-keyboard
- TZ 3880 manual controller (in the following: "mouse")
- Printer
- USB storage devices, e.g. USB sticks
- USB hub
- USB barcode scanners

2.7.5 Connection of analytical balances

Analytical balances are to be connected to the RS232-2 using an appropriate cable

2.8 Setting the Language of the Country

The ex-factory default language setting is English. When the piston burette is switched on, the main menu will appear once the boot sequence is completed:

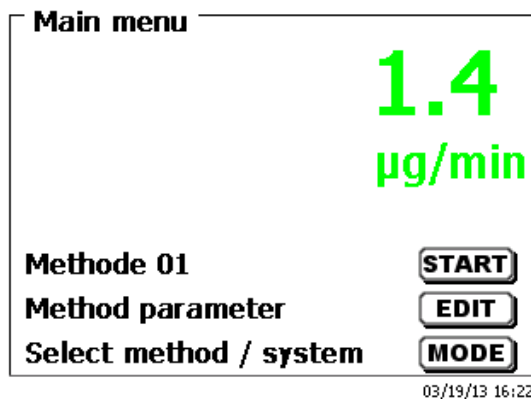


Fig. 13

Using <SYS/<F7> or <MODE>, followed by <System settings> you navigate to the system settings. The very first menu is to be used for setting the language of the country:

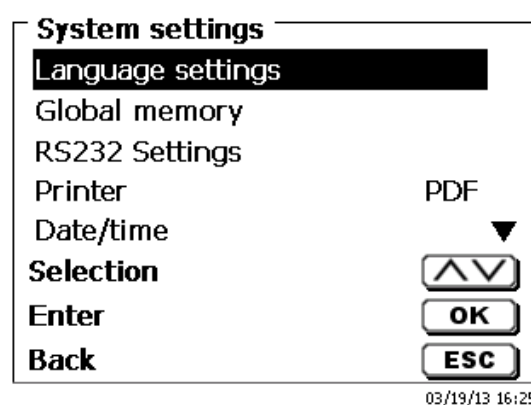


Fig. 14

Use <ENTER>/<OK> to call the menu. Select the national language using the <↑↓> arrow keys, confirm it with <ENTER>/<OK>:

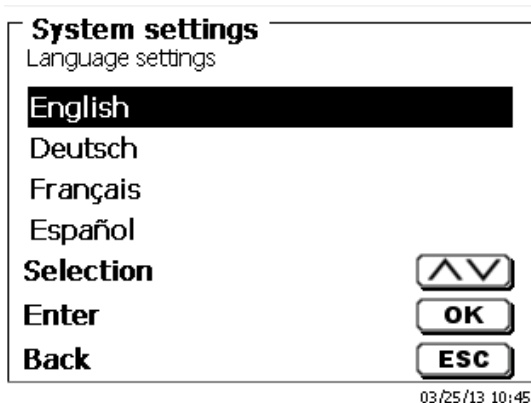
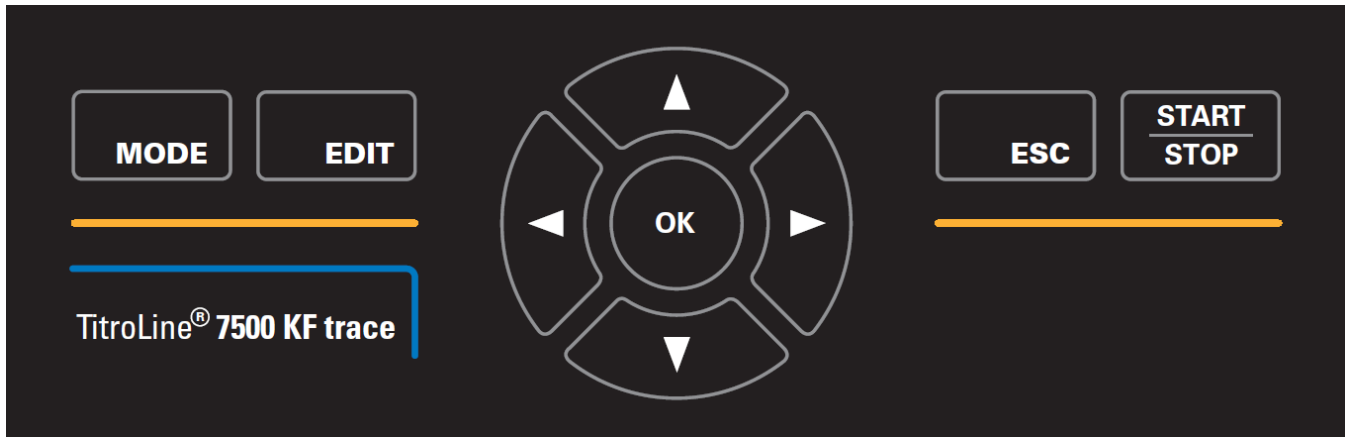


Fig. 15

The selected language will appear immediately. Pressing the <ESC> key twice will return the user to the main menu.

3 Working with the Titrator TitroLine® 7500 KF trace

3.1 Front Keyboard



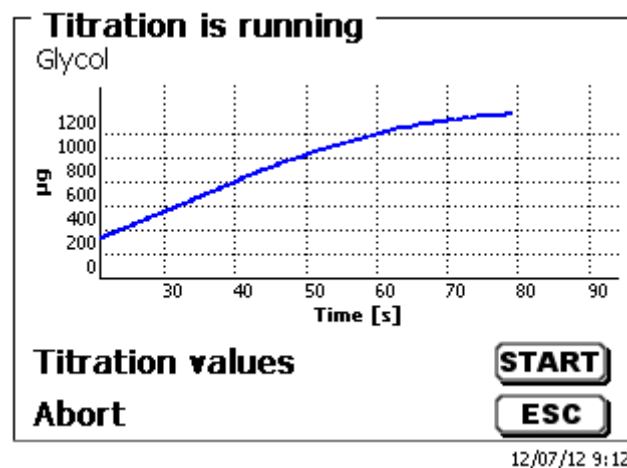
Apart from alphanumeric input (a-z, A-Z, 0-9) and a few other functions, almost all functions can be performed using the front keyboard.

- <Mode>:** Methods selection and system settings
- <EDIT>:** Changing the current method, new method, copy, print and delete method
- <ESC>:** **<ESC>** will take you back to the previous menu level.
- <START>:** Start and Stop of a current method


The individual functions are described in detail in **Chapter 3.4, External PC Keyboard**.

3.2 Display

The display consists of a graphical LCD display with a resolution of 320 x 240 pixels. It also offers the possibility to display graphics, e.g. the measuring curve while or after the titration is/was running:



3.3 External PC Keyboard

Keys	Function
<ESC>	<ESC> will take the user to the previous level on the menu.
<F1>/<START>	Start of a selected method
<F2>/<STOP>	Stop of the current method
<F3>/<EDIT>	Change of the current method, new method, copy method
<F4>/<FILL>	No function
<F5>/ 	Display and modification of the balance data. With <Shift + F5> display and modification of the global memories
<F6>/<MODE>	Selection of method, rinsing, system settings
<F7>/<SYS>	System settings (language selection, time/date ...)
<F8>/<CAL>	No function
<F9>/+ / -	Change of sign
<F10>/<DOS>	No function
Num/ Scroll Lock/ Lock	Without function
Prt Sc Sys Rq	Without function
<ESC>	Selection of the method-selection menu from the main menu. Elders: <ESC> will take you back to the previous level in the menu.
<↑> <↓> <←> <→>	Selection of individual menus and numeric values
0...9	Input of numeric values
<ENTER>	Confirmation of input parameters
< ← Backspace >	Deletion of one input digit / an input character to the left of the blinking cursor
Letters, ASCII-symbols	Alphanumeric input possible. Uppercase and lowercase possible.
All other keys	Do not have any function

3.4 Menu Structure

There are 4 selection menus:

- Start or main menu
- Method parameters
- Method selection
- System settings

After power-up, the main menu is always the first menu to appear. The method displayed will always be the last method that was used (Fig. 24).

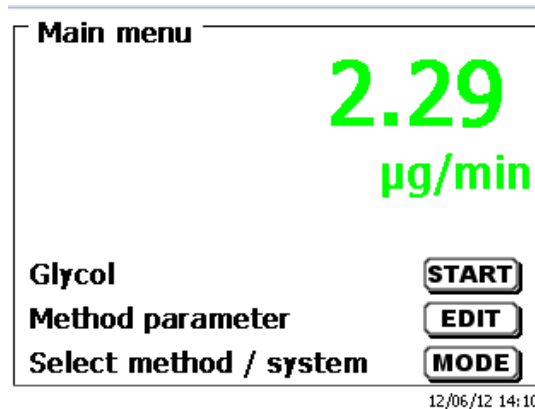


Fig. 16

Pressing <START> will result in the immediate execution of the method shown. <EDIT>/F3 will take you to the method parameters

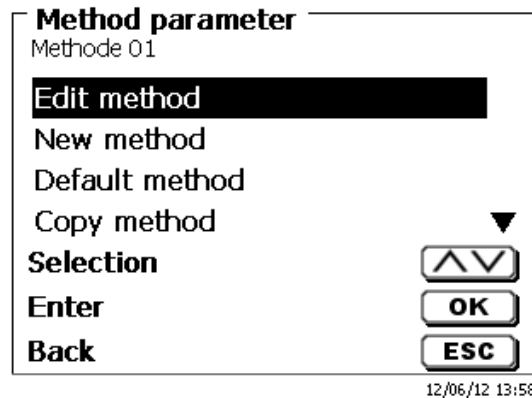


Fig. 17

At this point you can

- modify the current method
- create a new method
- call and memorise standard methods
- copy or delete an existing method

Use the <↓> und <↑> keys to select the submenus, confirm your selection with <OK>/<ENTER>. <ESC> will take you back to the main menu.

<MODE>/F6 leads you to the “select method“ menu:

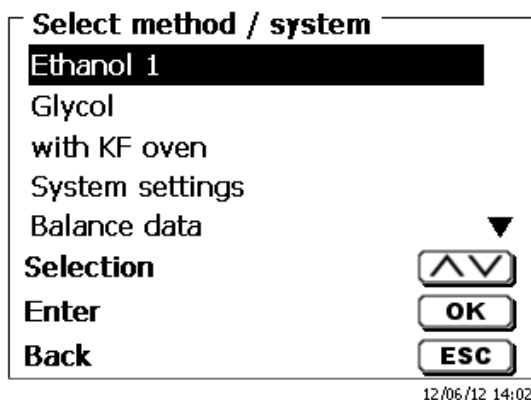


Fig.18

Existing methods can be selected by pressing the <↓> und <↑> keys and confirming the selection with <OK>/<ENTER>. Once the selection made, you will return to the main menu with the newly selected method. If no method is selected, <ESC> will also take you back to the main menu.

To navigate directly to the system settings (Fig. 19 and Fig. 20) you can use the <SYS>/F7 key; you can also navigate there through the method selection menu.

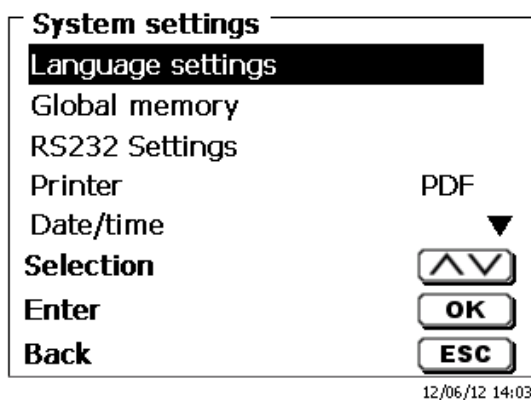


Fig. 19

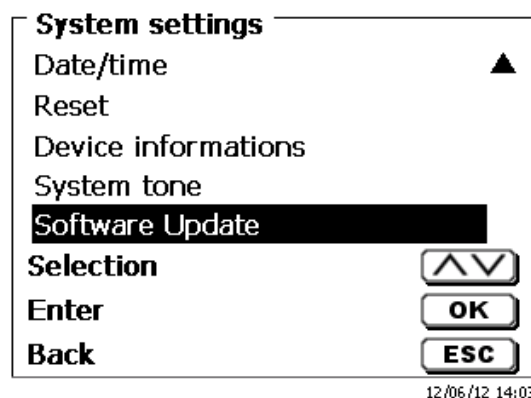


Fig. 20

3.5 Main Menu

After power-up, the main menu is always the first menu to appear. The method displayed will always be the last method that was used.

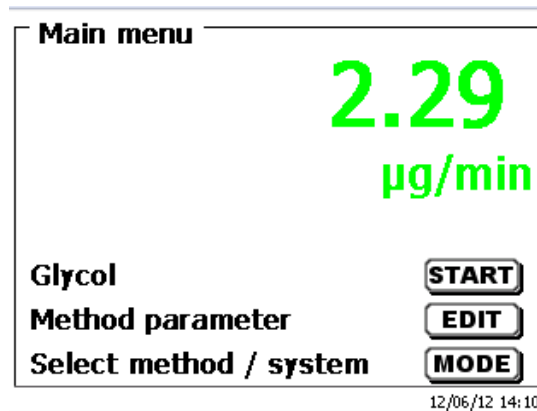


Fig. 21

3.5.1 Starting a Titration

Once all preparations have been finished, you can start to titrate samples. The titrator starts automatically with the conditioning process when it switched on and anolyte is present in the titration vessel. Here the titration cell is titrated until it is dry. This includes the entire water of the anolyte and even adherent liquids in the titration vessel.

If the start drift value is not reached (normally 10 µg/min) the method can't be started.

Start the selected method with the <START> in the main menu. If the drift value is below a set value (normally 10 µg/min) you will be be prompted to dose the sample, for the sample identification (Fig. 22) and the weighed-in quantity (Fig. 23).

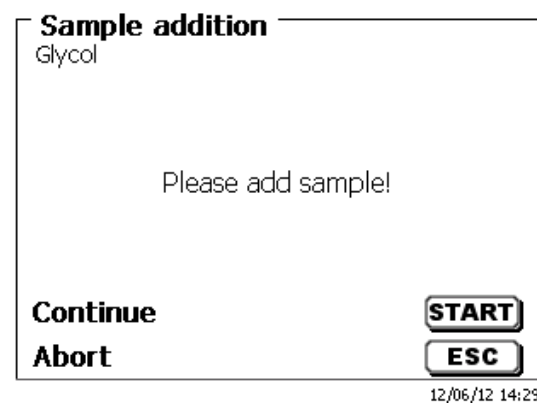


Fig. 22

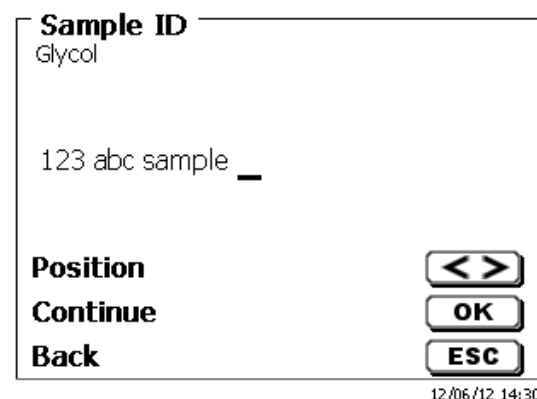


Fig. 23

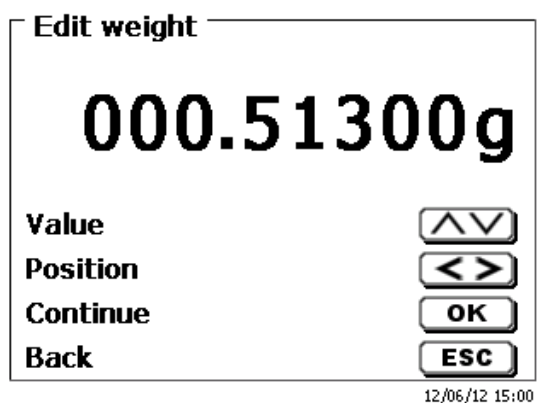


Fig. 24

The balance data can be entered using the front keyboard or an external keyboard. The input is to be confirmed with <OK>/<ENTER>.

In the case of an automatic acceptance of the balance data, the weighed-in quantities will be read in from a memory. If the memory does not contain any balance data, a message will appear to indicate that no balance data are present:

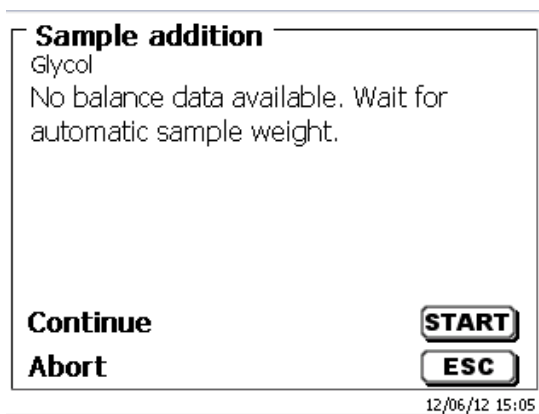


Fig. 25

Pressing the Print key will transfer the balance data, too. Titration will then begin directly after the transfer of the balance data without any further confirmation being necessary. The display will show the μA -value, the drift value and the current consumption. The top of the display will show the "Titration is running" status indication and the method being used:

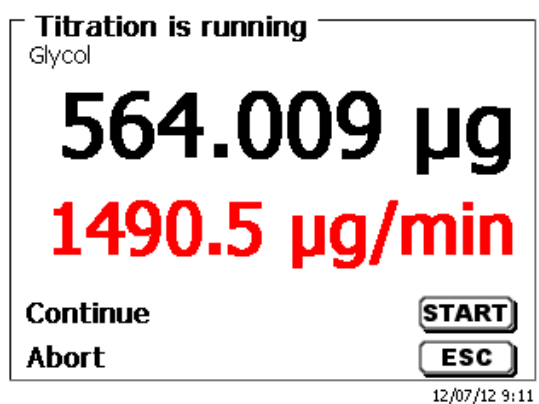


Fig. 26

Pressing the <Mode>/<F6> will cause the titration curve to be displayed (Fig. 34).

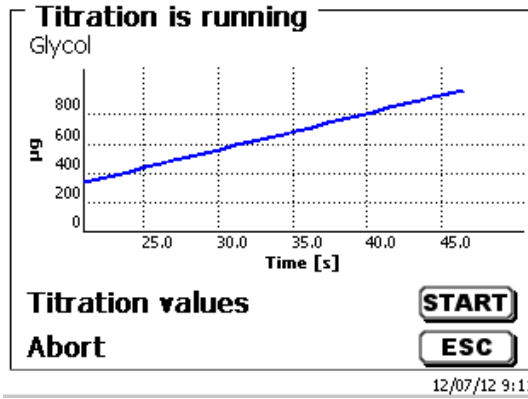


Fig. 27

Scaling of the chart will be done automatically. The result will be displayed at the end of the titration

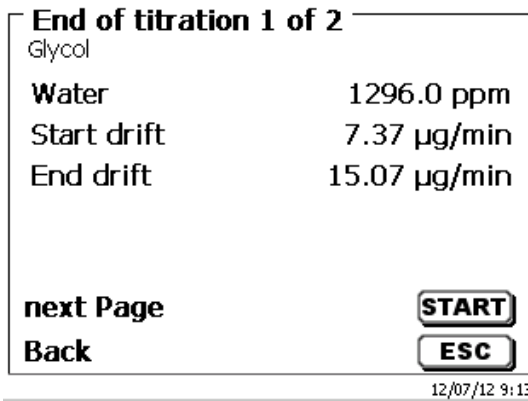


Fig. 28

<MODE>/<F6> can be used to view the titration curve or further results:

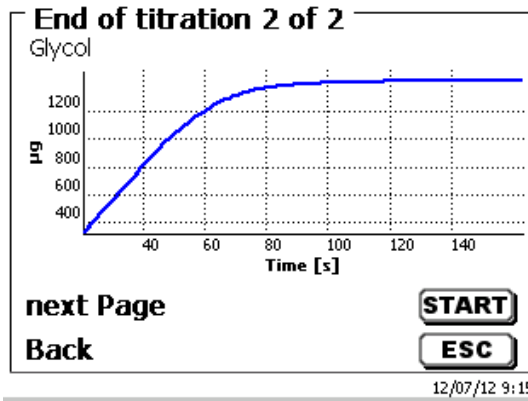


Fig. 29

If a printer is connected, the results will either be printed according to the settings made for the method, or else they will be memorised in the form of a PDF- and CSV-file file on a connected USB stick. If no printer or USB stick is connected, the bottom left corner of the display will show the message “no printer” or “no USB stick”.<ESC> will take you back to the main menu where you can start the next titration immediately.

4 Method Parameters

From the main menu (Fig. 21), <EDIT>/<F3> will take you to the method parameters:

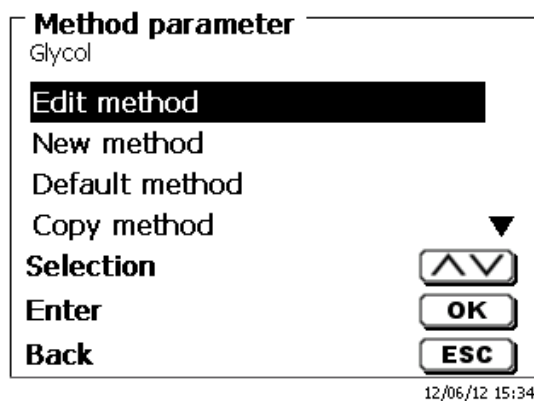


Fig. 30

4.1 Method editing and new method

If you select <edit method> or <new method> you will be taken to the modification or new creation of a method. Selecting <new method> will always lead to the prompt for the input of a method name (Fig. 48). This prompt will not appear in the case of the modification of an already created method.

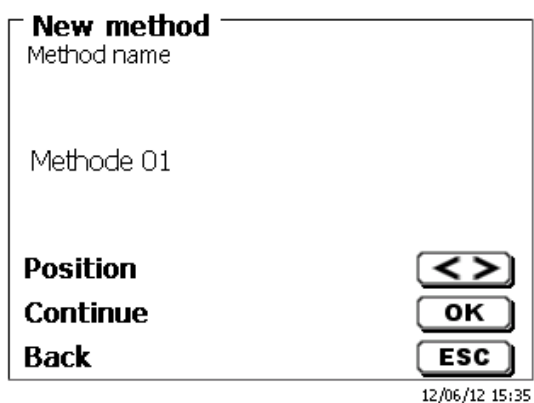


Fig. 31

The method name can contain up to 21 characters. Special characters are also possible. If no keyboard is connected, the method name being displayed has to be adopted (in the present case "Method 04"). Numbering of methods will occur automatically. Press <OK>/<ENTER> to confirm the input. The method name can be changed at any time. Please continue at this point with **Chapter 4.6**.

4.2 Default methods

The <Default methods> item of the TitroLine® 7500 KF trace contains a series of ready-made standard methods which can be conveniently selected:

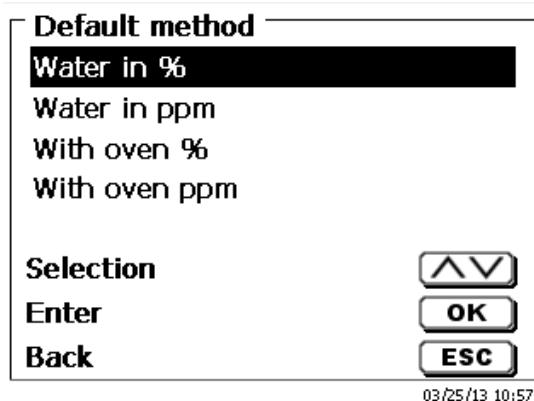


Fig. 32

Once the selection made, you are directly prompted for the input of the method name.

Fig. 33

The standard name may be adopted or modified. Subsequently, you will be taken to the <Change method parameters> item. Please continue at this point with **Chapter 4.6**.

4.3 Copy Methods

Methods can be copied or stored with a new name. If you select this function, the current method will be copied and you can include a new name

Fig. 34

A new name with the suffix [1] is assigned automatically in order to avoid the existence of two methods having the same name. Subsequently, you will be taken to the <Change method parameters> item. Then you proceed with **Chapter 4.6**.

4.4 Delete Methods

If this function is selected, you will be prompted to know whether the current method is actually to be deleted. You have to reply <Yes> in explicit terms and also confirm this reply with <OK>/<ENTER>.

Fig. 36

4.5 Print method

The currently selected method can be printed on a connected printer or stored on an USB drive as PDF file

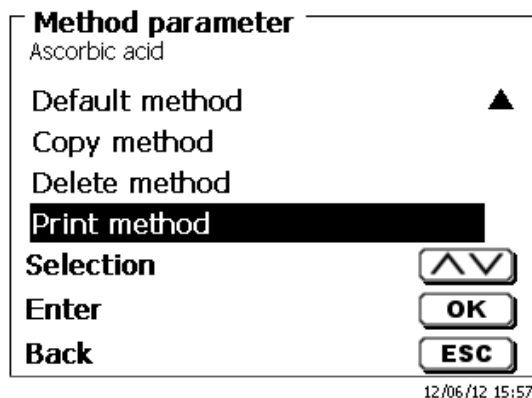


Fig. 36

4.6 Change Method Parameters

The input or modification of the method name was already described in **Chapters 4.1**.

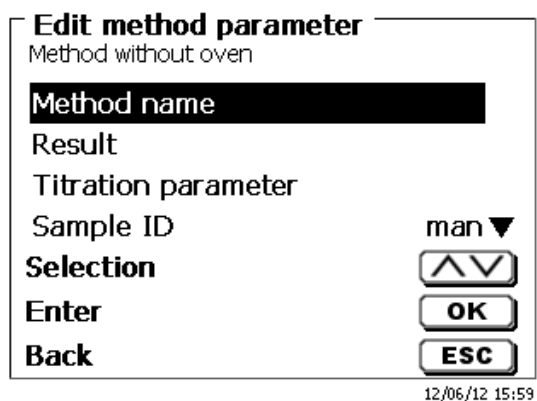


Fig. 37

4.6.1 Result

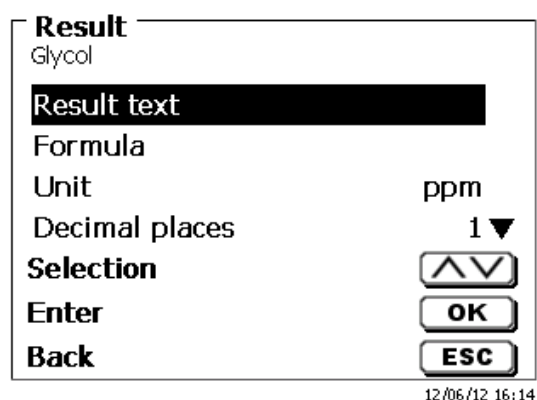


Fig. 38

Under result you can change the result text, change the formula and result unit, set the decimals for the results, select the statistic or store the result in a global memory.

4.6.1.1 Result text

The result text is used in the result display and printouts. It can be changed from “result” to any other alphanumeric name. For KF titration “water” is useful.

Result text 1

Glycol

Water

Position <>

Continue OK

Back ESC

Fig. 39

12/06/12 16:15

4.6.1.2 Calculation Formula

The appropriate calculation formula is selected on the **Formula selection** submenu:

Formula selection

Glycol

µg

(µg-B)*M*F1/(F2*W)

µg*M*F1/(F2*W)

Selection ^v

Enter OK

Back ESC

Fig. 40

03/25/13 11:02

The following calculation formulae are available

Formula	Additional information
µg	Formula for calculating only the absolute water content in µg
(µg-B)*M*F1/(W*F2)	Formula for calculating the concentration of a sample taking into account a blank value in terms of µg.
µg*M*F1/(W*F2)	Formula for calculating the concentration of a sample

The abbreviations used here have the following meaning:

µg: Blank value in ml. Mostly determined by way of titration
 B: Mol; mol- or equivalence weight of the sample. Can also be used for other calculations
 M: Factor 1,2 are conversion factors
 F1,F2
 W “Weight“, weighed-in quantity in g or volume in ml.”

After selecting a formula, please confirm your selection with <OK>/<ENTER>:

Formula parameter
 $(\mu\text{g-B}) * M * F1 / (F2 * W)$

B (Blank value)	0.0000 ml
M (Mol)	1.00000
F1 (Factor 1)	1.0000
F2 (Factor 2)	1.0000 ▼

Selection ▲▼
Enter OK
Back ESC

03/25/13 11:03

Fig. 41

The values for the blank value and the factors can be entered manually or read from a global memory. The values from a global memory were defined in advance by a titration or were manually entered.

Formula parameter
 B (Blank value)

fix value
Global memory

Selection ▲▼
Enter OK
Back ESC

12/06/12 16:24

Fig. 42

System settings
 Global memory

->M01 Blank value ext... *1.0000

Selection ▲▼
Enter OK
Back ESC

03/25/13 11:10

Fig. 43

The used global memory is displayed. Here in the example it is M01 (blank external extr.):

Formula parameter
 $(\mu\text{g-B}) * M * F1 / (F2 * W)$

B (Blank value)	M01
M (Mol)	1.00000
F1 (Factor 1)	1.0000
F2 (Factor 2)	1.0000 ▼

Selection ▲▼
Enter OK
Back ESC

03/25/13 11:05

Fig. 44

Storing results in global memories is described in Chapter 4.6.1.7

The values of the individual parameters of the selected calculation formula can now be input one by one.

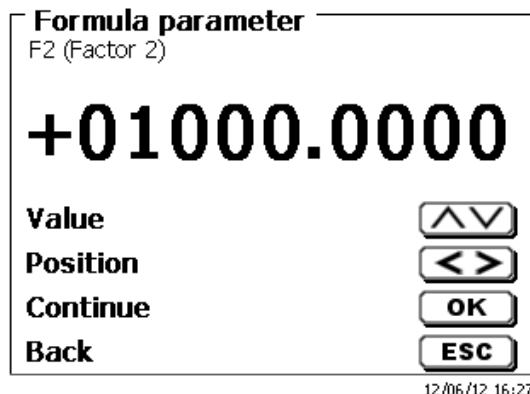


Fig. 45

4.6.1.3 Sample weight and volume (sample quantity)

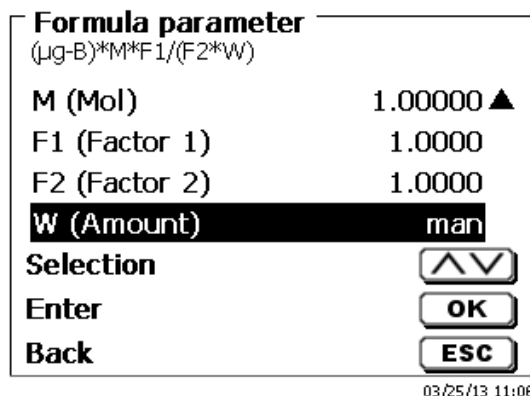


Fig. 46

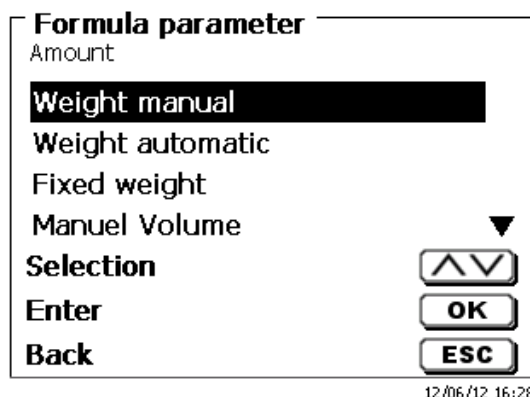


Fig. 47

The Sample Quantity (W) item is used to select whether one is wishing to use a sample weight or a sample volume for titration or solution preparation.

You have the following options:

- **Manual sample weight:** The sample weight is enquired by a prompt at the start of the method
- **Automatic sample weight:** The sample weight is automatically transferred by a connected balance.
- **Fixed sample weight:** A fixed sample weight is input in g. This weight will then automatically be used for each start of the method.
- **Manual sample volume:** The sample volume in ml is prompted at the start of the method and manually input.
- **Fixed sample volume:** A fixed sample volume is input in ml. This volume will then automatically be used for each test of the method.

4.6.1.4 Formula unit

The formula unit can be selected in the **Unit** submenu.

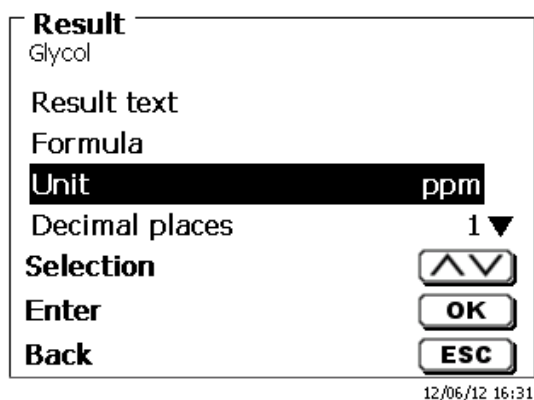


Fig. 48

Once the selection made (e.g. % or ppm), the unit will also be displayed as piece of information on the display.

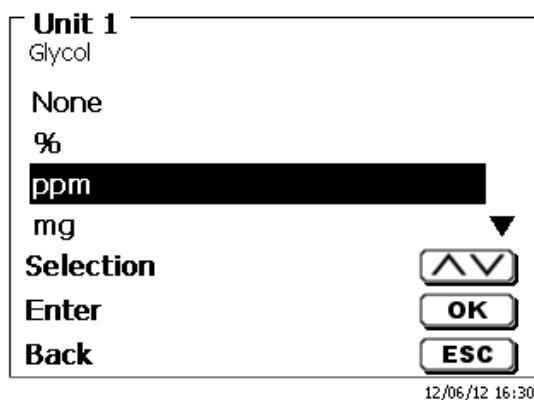


Fig. 49

4.6.1.5 Decimal digits

To conclude, it is possible to determine the number of decimal digits from 0-6. The standard setting is 1.

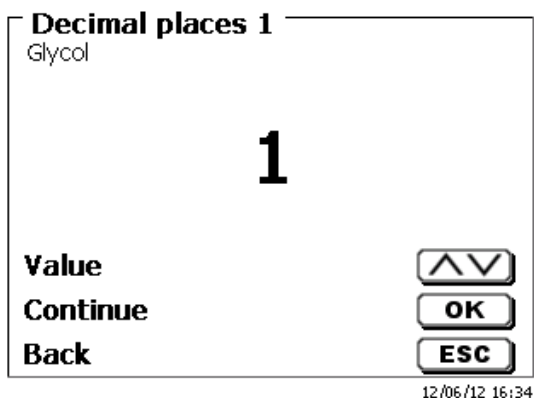


Fig. 50

4.6.1.6 Statistics

The mean value and relative standard deviation can be automatically calculated and documented by using statistics.

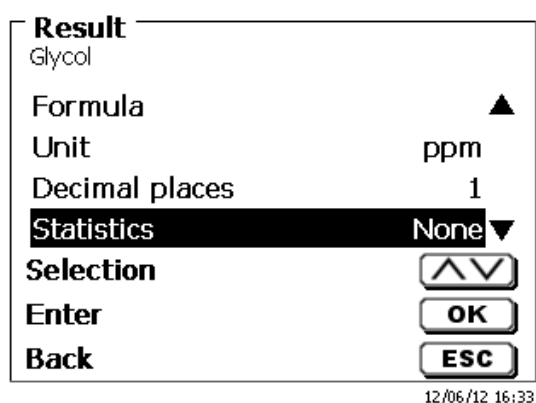


Fig. 51

The calculation of the mean value is already possible from two individual values. The calculation of the relative standard deviation is only possible from 3 single values. The maximum quantity is 10.

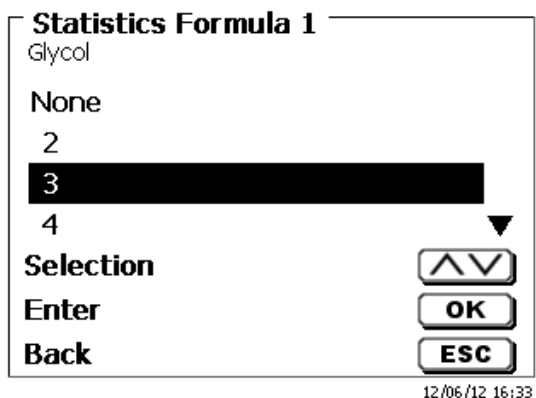


Fig. 52

The mean value and the relative standard deviation (RSD) are shown directly on the display or in the result printout.

4.6.1.7 Global Memories

Results of titrations can be written into one of the 50 global memories (M01 - M50) for additional calculations.

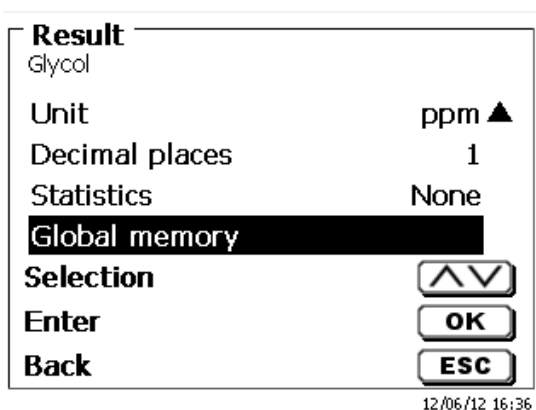


Fig. 53

The mean value is written into the global memory when the statistic is switched on. You enter the submenu with **<Enter/OK>**. If a global memory has not been created, a memory can be created by using the insert key **<Ins>**. The titrator proposes a memory name, such as **M01** (M01- M50). The name of the memory can be changed in reference to the application. Here in this example of **"M01"** for **"blank value extern..."**.

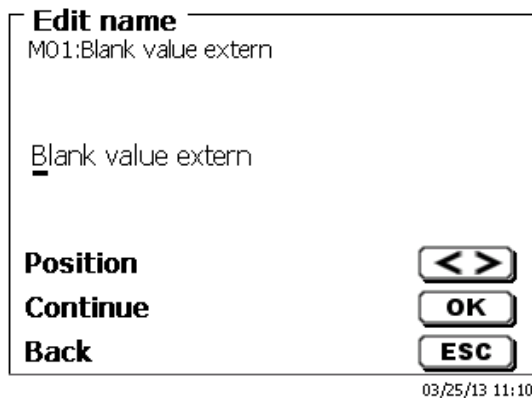


Fig. 54

This simplifies later the allocation of the global memory in another method.

Example: The result from blank titration is defined with the support of an extra method. The result in μg is thereby automatically written into global memory M01 by using the name "**blank value extern**".

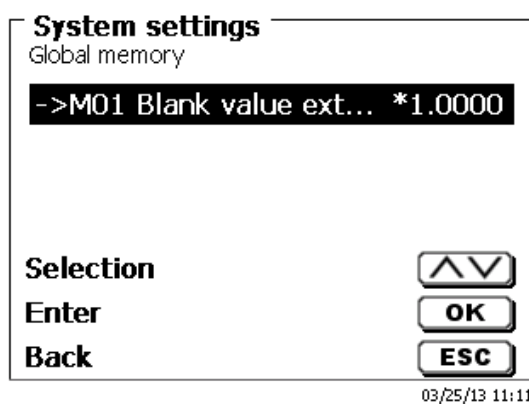


Fig. 55

The menu for the global memory can always be accessed by pressing Shift+F5 or via system settings. The name or values can be changed by using EDIT/F3 and have the methods shown that are used in the global memories.

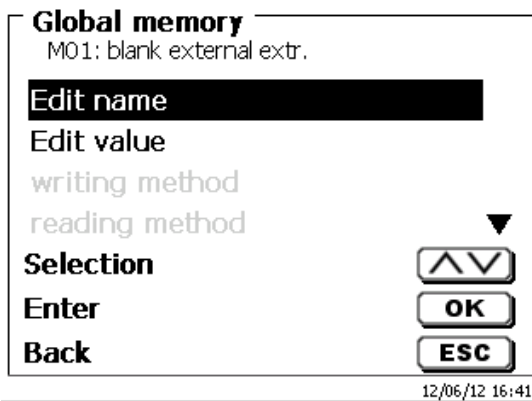


Fig. 56

4.6.2 Titration parameters

The <Titration parameter> submenu is used to determine the actual parameters of the method:

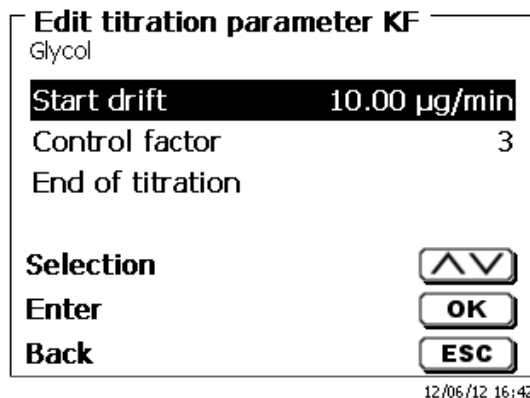


Fig. 57

Generally applicable titration parameters

The following parameters can be adjusted:

- Start drift
- Control factor

End criteria:

- Maximum titration time
- Minimum titration time
- Stop delay time
- Working point
- Stop drift (delta)
- Stop drift tolerance

Start Drift

The value of the start drift in $\mu\text{g}/\text{min}$ must be equal or even lower in order to start a titration. If the value is exceeded, the TitroLine[®] 7500 KF trace is in the conditioning mode. The standard value is $10.00 \mu\text{g}/\text{min}$. This value can be entered from 0.01 to $99 \mu\text{g}/\text{min}$

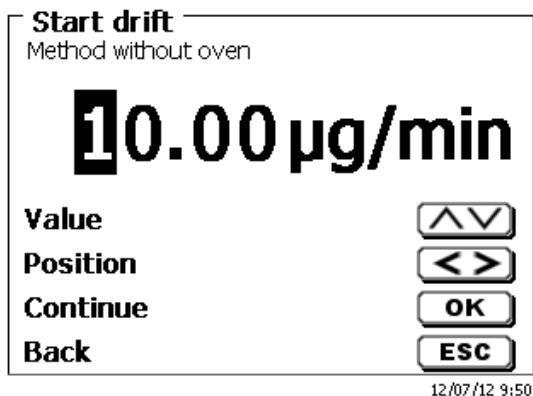


Fig. 58

Control factor

The control factor is a factor for the indicator control/speed. It can be set from 1 to 128. The pre-set value is 4.

1 = slow and exact, 128 = fast and not exact

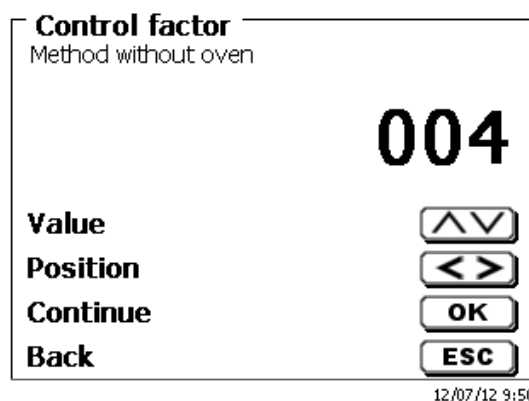


Fig. 59

Max. Titration Time

The maximum titration time is used with samples that generate an increased drift in the end and when it is not possible to achieve stable end values. The max. titration time can be adjusted from 0 to 9999 s. The standard value is pre-set to 600 s.

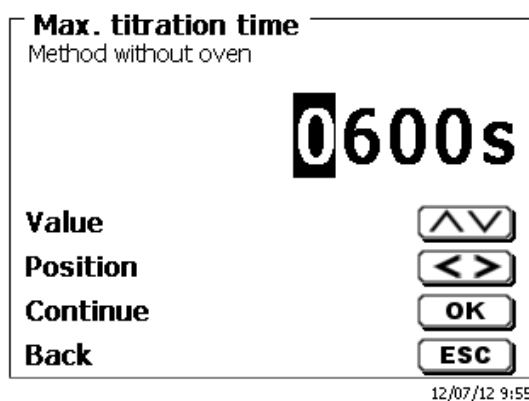


Fig. 60

Min. Titration Time

After the minimum titration time has passed, the adjusted stop criteria are checked. The min. titration time can be adjusted from 1 to 1800 seconds. The standard value is pre- set to 60 seconds. Particularly when worked with a KF oven the minimum titration time must be higher.

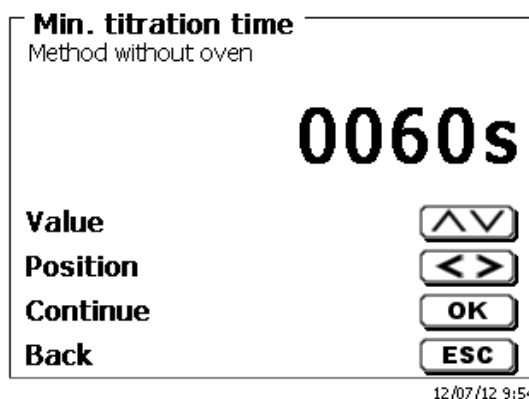


Fig. 61

Stop delay time

Is the time in seconds in which the drift-stop criteria are being checked. The stop delay time can be set between 0 and 60 seconds. The pre-set standard value is 5 s.

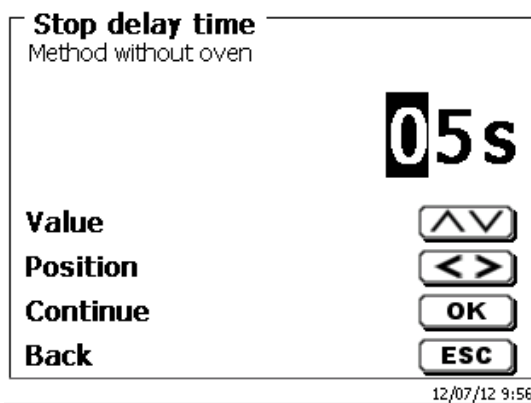


Fig. 62

Working point

The working point in mV is the base value for the indicator electrode. It can be set from 1 to 1000 mV. 300 mV is pre-set as standard value and works for many reagent/reagent combinations. A higher value is maybe sometimes necessary.

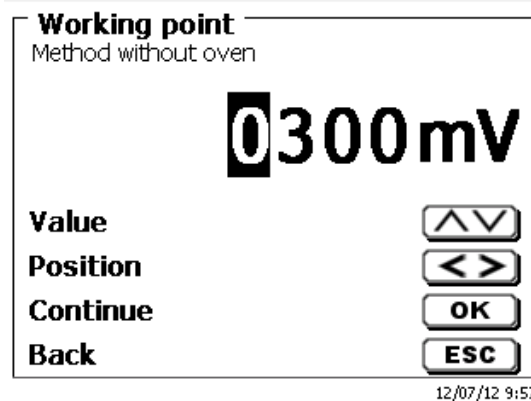


Fig. 65

Stop Drift (delta)

The stop drift in $\mu\text{g}/\text{min}$ is not an absolute end value. The end value of a titration is always the currently measured drift + stop drift.

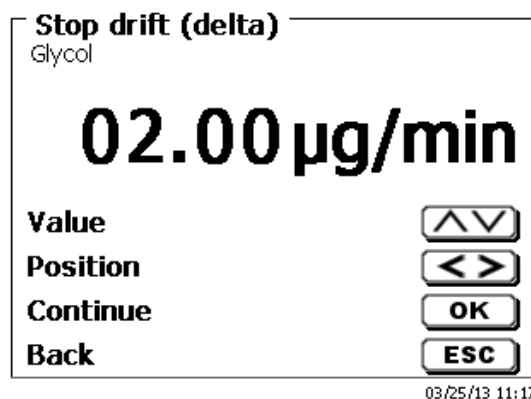


Fig. 64

An example:

If the current drift shows a value of $1.5 \mu\text{g}/\text{min}$ and the stop drift is set to $2.0 \mu\text{g}/\text{min}$, then the end drift actually to be reached is $3,5 \mu\text{g}/\text{min}$.

This means: The lower the entered stop drift, the longer takes the measurement. If a high stop drift (e.g. 20 $\mu\text{g}/\text{min}$) is entered, the measurement ends significantly faster. Low value = exact measurement, high value = inexact measurement. As stop drift 2 $\mu\text{g}/\text{min}$ are pre-set as standard value. The value can be entered from 0.01 to 25 $\mu\text{g}/\text{min}$.

Diagram 1 shows on the left the titration curve with the measured variable water per time and the derived variable drift per time.

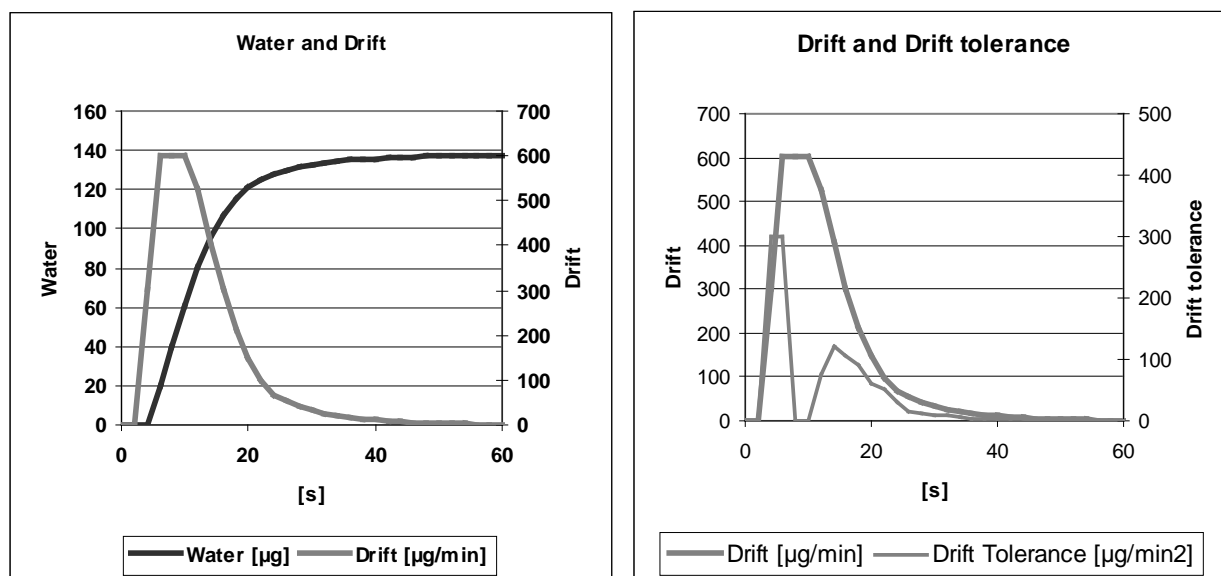


Diagram 1: Water and drift on the left, drift tolerance on the right

Stop Drift Tolerance

As stop drift tolerance 0.02 $\mu\text{g}/\text{min}$ is pre-set as standard value. The value can be entered from 0.01 to 25.00 $\mu\text{g}/\text{min}$.

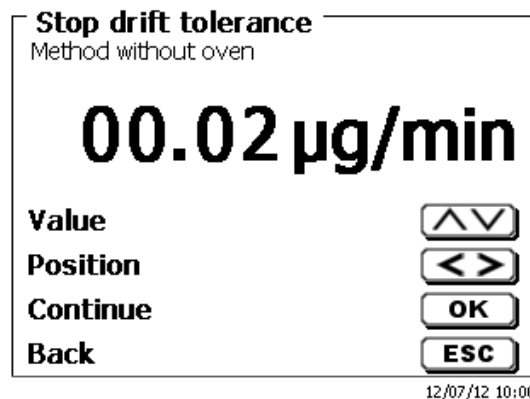


Fig. 65

In case the drift stop has not been reached as criterion, as new stop criterion is the stop drift tolerance will be used. It is the derivative of the drift with respect to time. Diagram 2 shows the typical progression of the stop drift tolerance. Thus, the automatic stop of titrations with side reactions is possible.

If the drift change is within the stop drift tolerance during the entire follow-up time, the measurement will be ended.

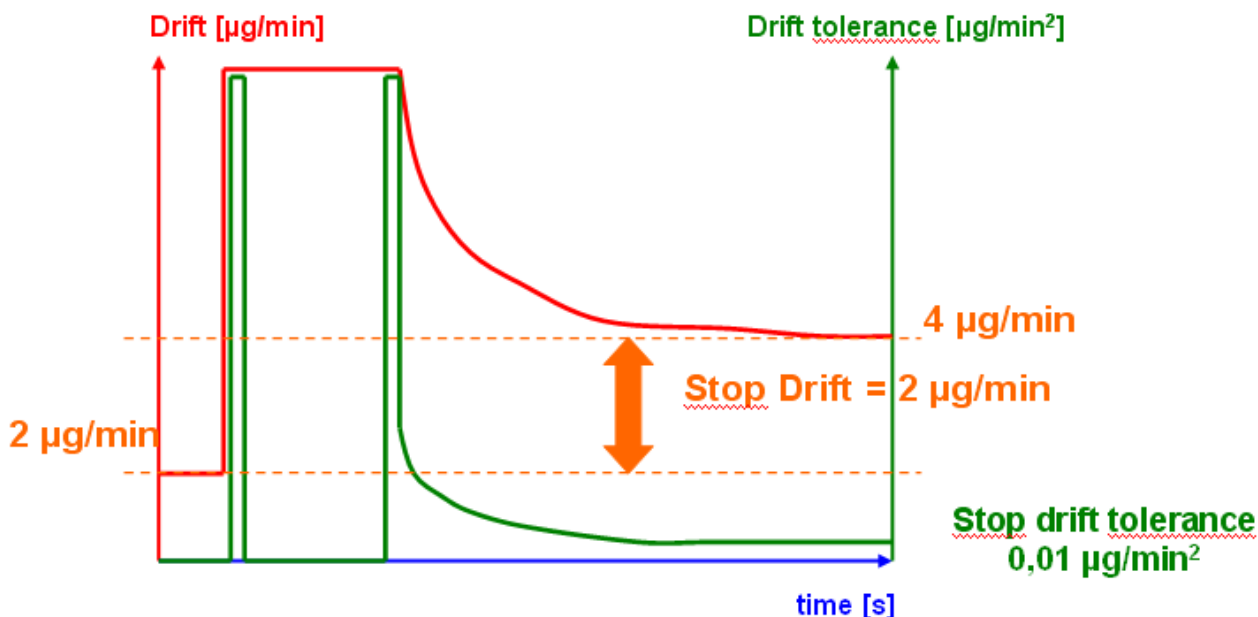


Diagram 2: The criterion stop drift as difference to the start drift, the stop drift tolerance as stability criterion for the drift.

Only one of the two end criteria stop drift and stop drift tolerance must be met to end the measurement.

4.6.3 Sample identification

In the manual titration and in the preparation of solutions it is possible to input a sample identification. The possible input includes manual, automatic or no sample description at all.

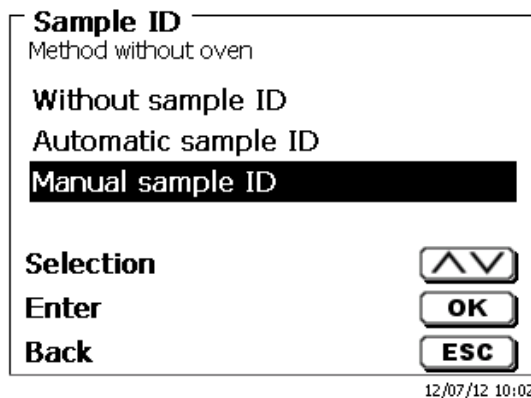


Fig. 66

For a sample description of the 'manual', a prompt for the sample description will always be displayed at the start of the method (Cp. also chapter 3.6, Main menu). For an 'automatic' sample description there will be selected a master description (in the current case this is water, cp. Fig. 67), which will then automatically be numbered starting on 01.

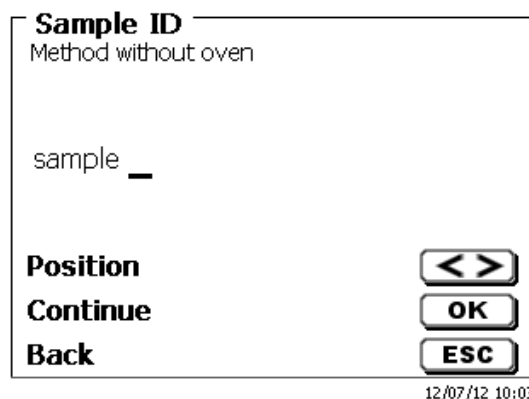


Fig. 67

After a new power-up, numbering will resume with 01.

4.6.4 Documentation

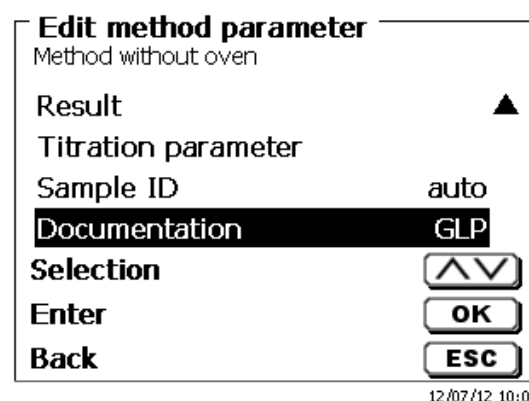


Fig. 68

Three different format settings are available for documentation on a printer or USB device: “short”, “standard (with curve)” and “GLP”:

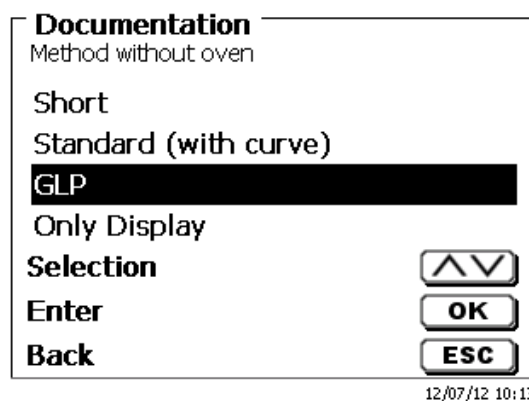


Fig. 69

Short documentation	Standard documentation	GLP-Documentation
Method name, date, time, duration of titration, sample description, weight/volume, starting and end measurement values, results and calculation formula	Same as 'Short documentation' + titration curve	Same as 'Standard documentation' + method contents

5 System settings

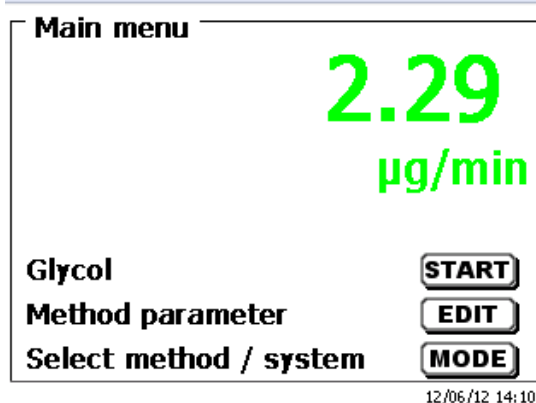


Fig. 70

From the main menu (Fig. 72), <SYS>/<F7> will get you to the system settings:

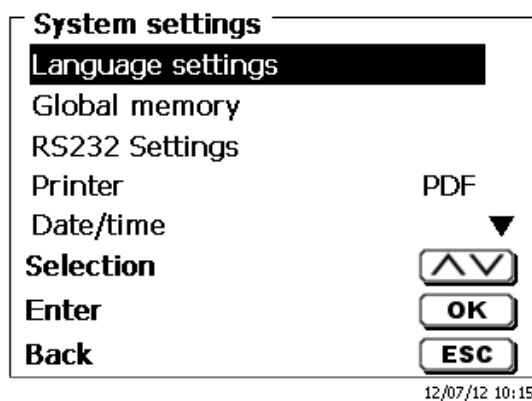


Fig. 71

Setting the national language was already described in **Chapter 2**

5.1 Global Memory

The handling with the global memories were already described in the chapter 4.6.1.7.

5.2 RS232 Settings

The <RS232 settings> item can be used to determine the device address of the TitroLine® 7500 KF trace and set the parameters of the two RS232 interfaces independent from each other:

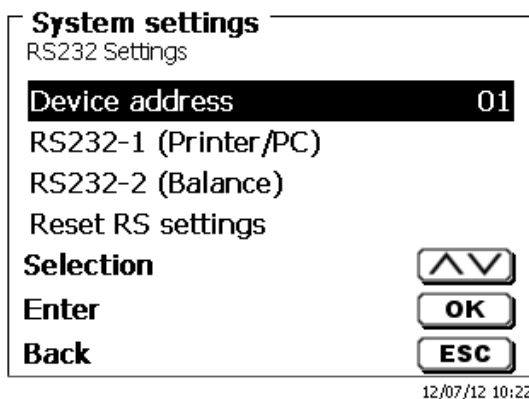


Fig. 72

The device address can be set from 0 – 15. Address 1 is the default setting:

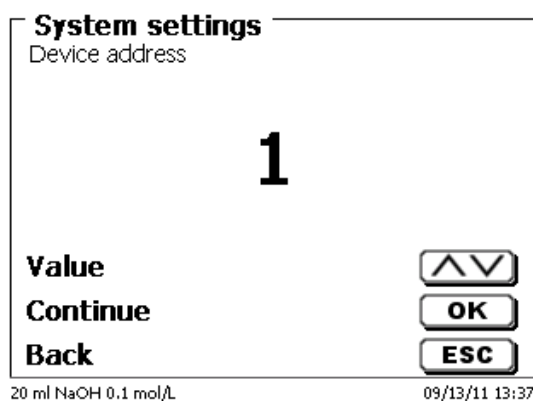


Fig. 73

The baud rate is preset to 4800. It may be set to 1200 – 19200:

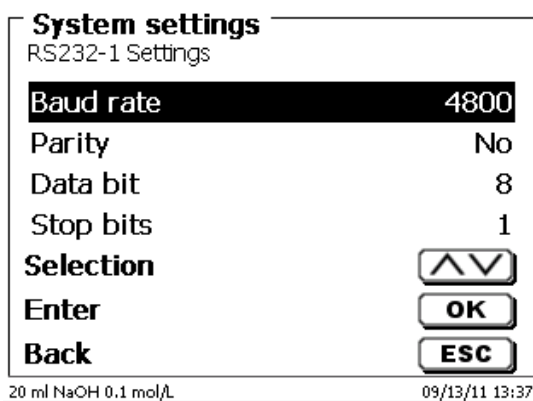


Fig. 74

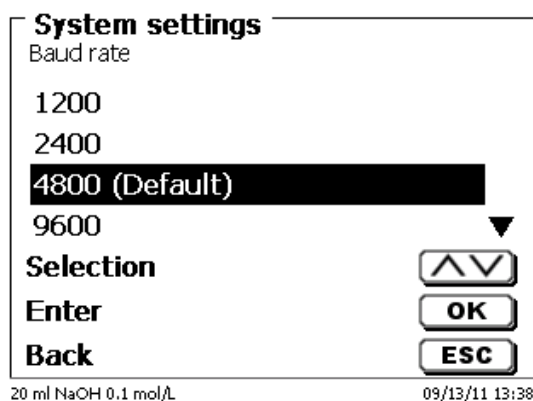


Fig. 75

The parity can be selected amongst <No>, <Even> and <Odd>. <No> is the default setting.

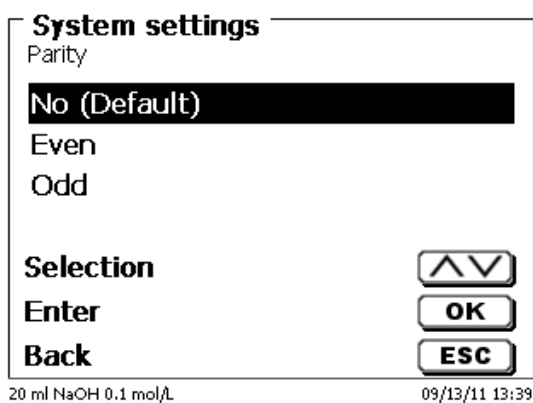


Fig. 76

You may select between 7 and 8 data bits. 8 bits is the default setting.

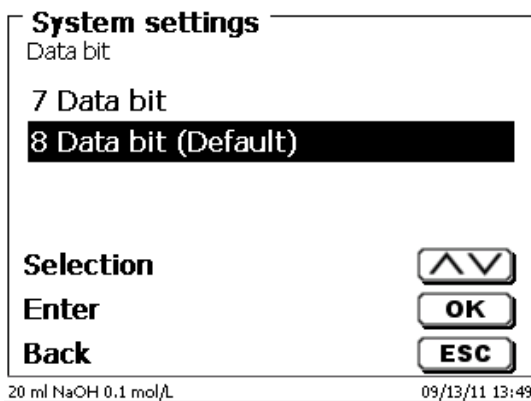


Fig. 77

The RS232 parameters can be set to the factory settings.

5.3 Date and Time

The factory time setting is Central European Time. This setting may be changed, where necessary:

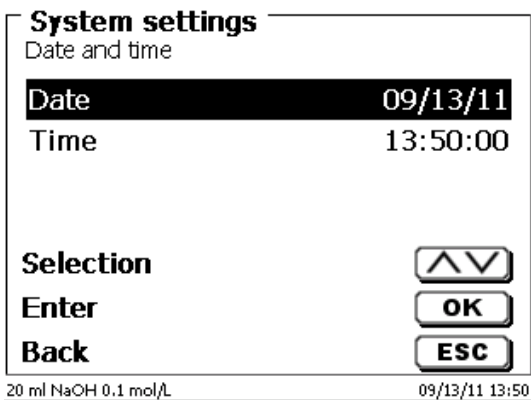


Fig. 78

5.4 Password

The activation of the password has not yet been implemented for the current version 13_12t. Please contact SI Analytics for sending you an update version.

5.5 RESET

RESET will reset all settings to the factory setting.

Please note: All methods will also be deleted. So please print the methods or export/copy them to a **connected USB storage medium (this will be possible with a higher update!)**.

The RESET has to be confirmed separately once again:

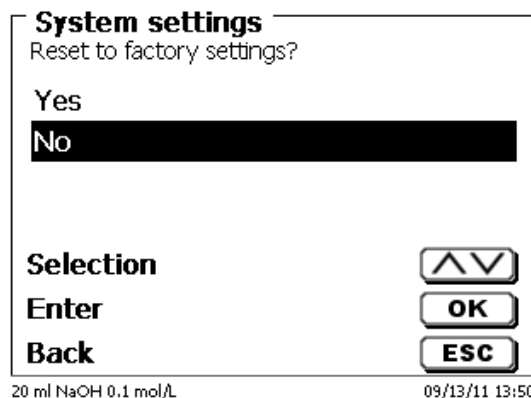


Fig. 79

5.6 Printer

For connecting printers please refer to chapter 7.3.

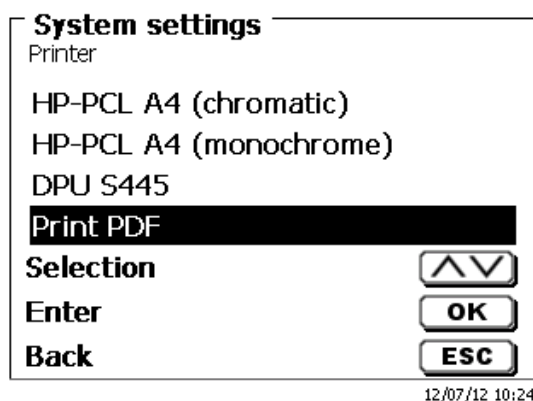


Fig. 80

5.7 Device Information

<Device Information> contains information about

- the current software version
- the serial number of the device
- printer driver and update version
- device address
- number of measurements (Starts of a method)
- a number of strokes/filling cycles

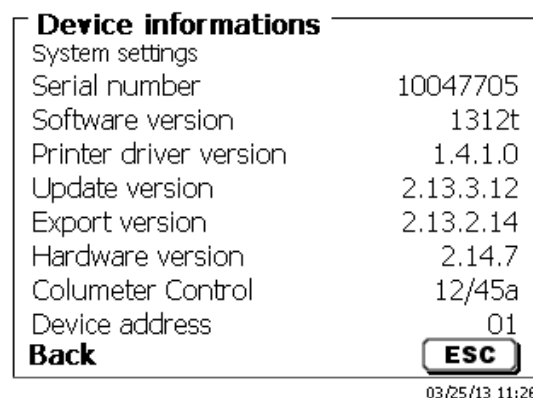


Fig. 83

5.8 System Tone

This is the point to set the volume of the system sounds and the front keyboard of the device. The system sounds become audible e.g. at the end of the titration or in case of an erroneous operation. The keys of the front keyboard produce a clicking sound if the key was used successfully.

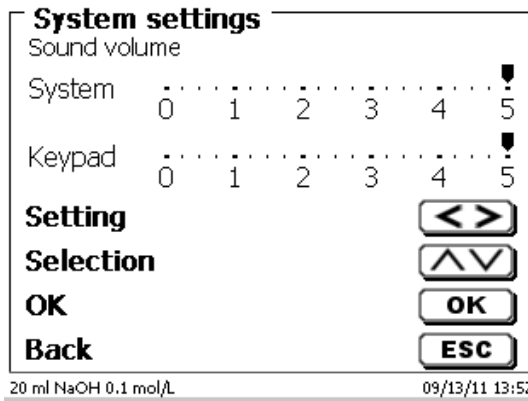


Fig. 82

No sounds will occur when the external keyboard is used.

5.9 Data exchange

All methods with all parameter settings and global memories can be stored and restored on a connected USB-memory. It is also possible to transfer the settings from one titrator to another one. The backup will be started with **Settings backup**:

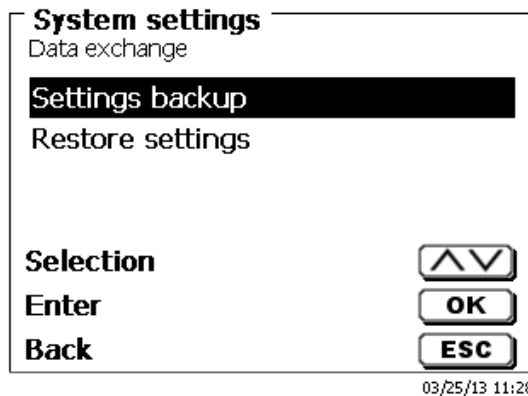


Fig. 83

Backup settings is displayed during the backup in blue:

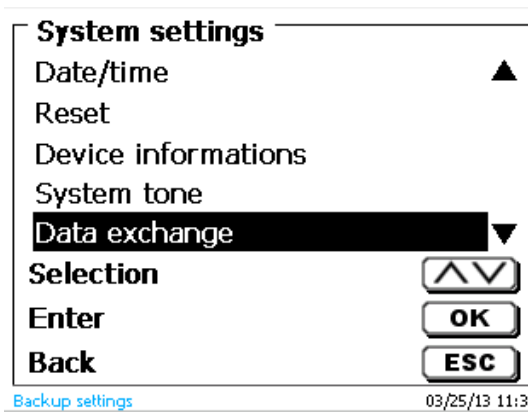


Fig. 84

After a Reset or a maintenance case it is possible to restore the backup with **Restores settings**:

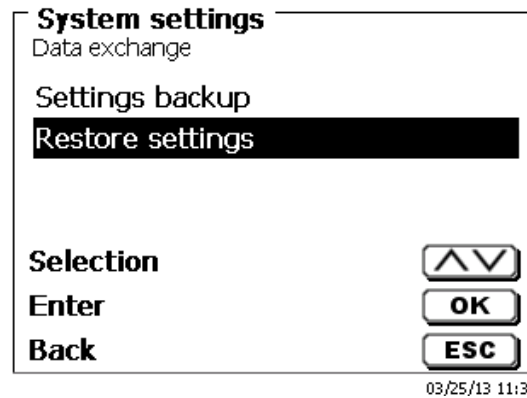


Fig. 85

The backup folder on the USB-memory Stick starts with the backup date. Here it is 130325_1132382_Setti... That means the backup is from 25th March 2013 11.32 hour:

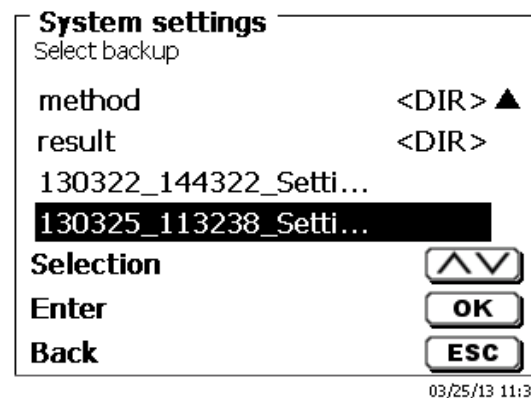


Fig. 86

Confirm the selection with Enter. During the restoring process of the backup appears "Settings are being restored" on the display in blue:

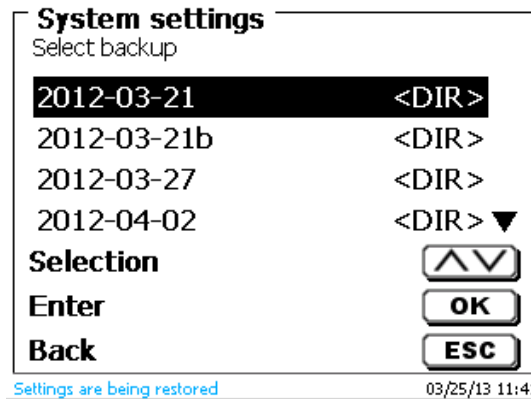


Abb. 87

5.10 Software Update

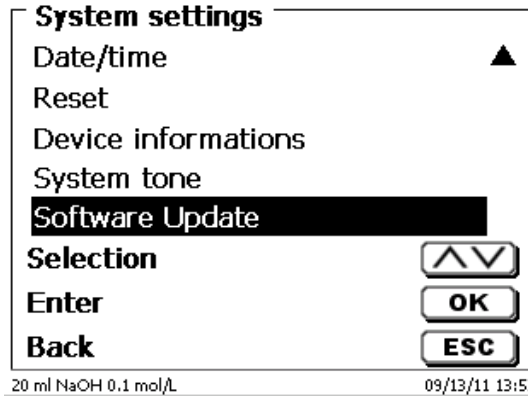
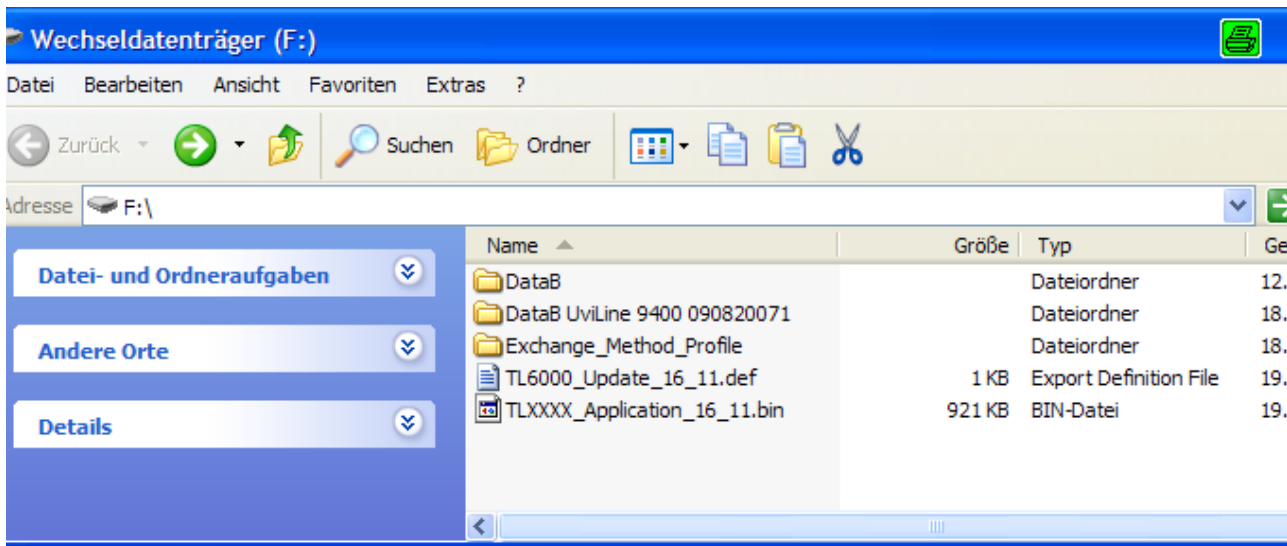


Fig. 88

An update of the device software requires a USB stick containing a new version. For this operation, the two files that are needed have to be located in the root directory of the USB device:



Plug the USB device into a free USB-A port, wait for some seconds, and then select the Software Update function. The valid software updates will be shown on the display. In the present case this is Version "16_11" from 19 April 2011.

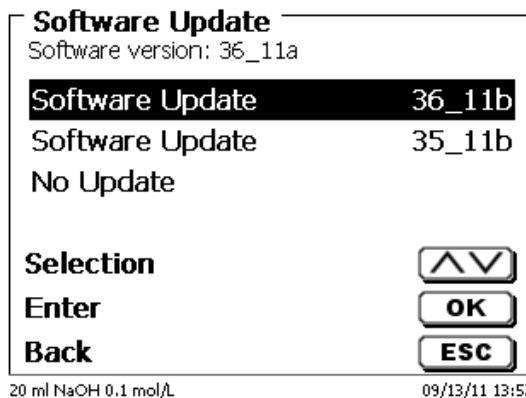


Fig. 89

After starting the update using <OK/ENTER>, next thing to appear is the following graphic:

roLine® 6000 □ □ □ □

Waiting for system readiness...

Vers.1.5.0.0.20

Fig. 90

which will change after a few seconds to the following display:

roLine® 6000 □ □ □ □

System is updating. Please wait...

Vers.1.5.0.0.20

Fig. 91

Upon completion of the update (approx. 2-3 minutes), the device will shut down the software completely and proceed to a new start.

Important: In the course of an update, the methods will not be deleted! You can continue to use them. If no valid update file is stored on the USB stick, the following message will appear:

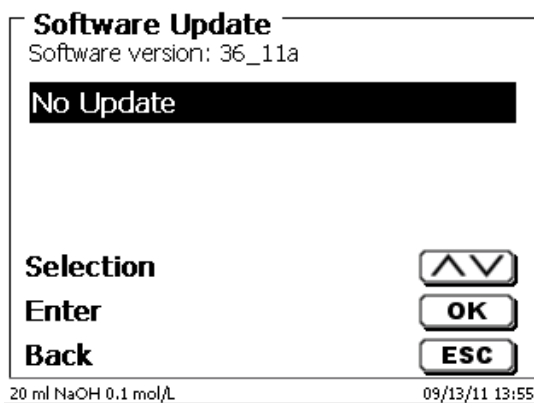


Fig. 92

6 Data Communication via RS-232- and USB-B interface

6.1 General Information

The tirator TitroLine® 7500 KF trace has two serial RS-232-C interfaces to communicate data with other devices. By means of these two interfaces it is possible to operate several devices on one computer (PC) interface.

In addition to that, the TitroLine® 7500 KF trace also has an alternatively USB-B interface, which can only be used to connect a PC.


RS-232-C-1 establishes the connection to a connected computer or to the previous device of the “Daisy Chain“. At the RS-232-C-2 it is possible to connect additional devices (Daisy Chain Concept).

PIN assignment of the RS-232-C interfaces:	PIN-No.	Meaning / Description
	1	T x D Data output
	2	R x D Data input
	3	Digital mass

6.2 Chaining multiple devices —“Daisy Chain Concept“

In order to activate several devices in a chain individually, each device must have an own device address. For this it is at first necessary to establish a connection from the computer to the RS-232-C interface 1 of the first device in the chain by means of a RS-232-C data cable, e.g. Type No. TZ 3097. With the additional RS-232-C data cable, Type No. TZ 3094, the RS-232-C- interface 2 of the first device is connected with the RS-232-C-interface 1 of the second device. At interface 2 of the second device it is possible to connect an additional device.

The TitroLine® 7500 KF trace can also be connected via USB cable TZ 3840 (type A (M) – type B (M), 1.8m). It is also possible to connect the TitroLine® 7500 KF trace via USB cable TZ 3840 (type A (M) --- USB type B (M), 1.8 m) to a USB interface of a PC. To accomplish this connection, a driver has to be installed on the PC. Then the USB-B interface takes over the function of the RS232-1 interface.

The address always consists of two characters: e.g. address 1 of the two ASCII- characters <0> and <1>. The addresses can be set from **00** to **15**, i.e. 16 possibilities. It must be ensured that the devices in a chain have different addresses. If a device is addressed with its address, this device will process this command without sending it to another device. The reply to the computer has also an own address. The addresses are allocated as described in  **Chapter 5.3**.

The burette TitroLine® 7500 KF trace receives commands from a PC at the interface 1 (USB- B) if the computer knows the address. It also sends the answer via this interface. If the address of the incoming command does not match the device address, the complete command will be forwarded to interface 2. Interface 2 is connected to interface 1 of another device. This device checks the address as well and reacts to the command as the first TitroLine® 7500 KF trace did before.

All information (data strings) which arrive at interface 2 of the burette TitroLine® 7500 KF trace will immediately be send to the computer via interface 1 (or USB-B interface). Thus, the computer receives the data of all devices. In practice it is possible to connect up to 16 devices to one computer- (PC-) interface.

6.3 Instruction Set for RS-Communication

The commands consist of three parts:	Address	two-digit aa,	e.g.: 01
	Command		e.g.: LR
	Variable, if necessary		e.g.: 14
	and end of command		<CR> <LF>

Every command must be completed with the ASCII - sign <CR> and <LF> (Carriage Return and Line Feed). Only if the respective action has ended the answers will be returned to the computer.

Example: The command to send the results from the TitroLine® 7500 KF trace with the address 2.

The command consists of the characters: 02LR<CR LF>

In detail:	02	=	Device address
	LR	=	Load results
	<CR LF>	=	Control character as command end

Command	Description	Reply
aaAA	automatic allocation of device address	aaY
aaMC1...XX	choosing a method	aaY
aaES	"ESC" function one step backwards	aaY
aaEX	"exit" function.back to main menu	aaY
aaGS	output serial no. Of device	aaGS08154711
aaLD	output of the measurement data	aaY
aaLR	output report (short report)	aaY
aaM	output the measurement value μ A	aaM0.1000
aaLI	output method content	
aaRH	request of identification	aaIdent:TL7500KFtrace
aaRC	send last command	aa"last command"
aaRS	report status	aaStatus:"text"
	possible answers are:	
	"STATUS:READY" for ready	
aaSM	start selected method	aaY
aaSEEPROM	EEPROM reset to factory defaults	aaY
aaSR	stop the actual function	aaY
aaSYS5	adjust language to "German"	aaY
aaSYS1	adjust language to "English"	aaY
aaSYS2	adjust language to "French"	aaY
aaSYS3	adjust language to "Spanish"	aaY
aaVE	Version number of the software	aaVersion

7 Connection of Analytical Balances and Printers

7.1 Connection of Analytical Balances

As it often happens that the sample is weighed in on an analytical balance, it makes sense to connect this balance to the TitroLine® 7500 KF trace. To connect the balance to the TitroLine® 7500 KF trace, the balance must have a RS-232-C-interface and the connection cable must be configured accordingly. For the following types of balances there are already assembled connection cables:

7.1.1 Balance	TZ-Number
Sartorius (all types), Denver Instruments partially Kern,	TZ 3092
Mettler, AB-S, AG, PG	TZ 3099
Precisa XT-Series	TZ 3183
Kern and Denver Summit with 9-pole RS232	TZ 3097

For all other types of balances it is possible to obtain an already assembled connection cable (on demand). For this we need detailed information about the RS-232-C-interface of the balance used.

The connection cable is to be connected to the RS-232-C-interface 2 of the TitroLine® 7500 KF trace. This side of the connection cables always consists of a 4-pole mini-plug. The other side of the cable can, depending on the type of balance, be a 25-pole plug (Sartorius), a 9-pole plug (Mettler AB-S) or a 15-pole specialised plug (Mettler AT) etc.

In order to allow the balance data to be sent to the TitroLine® TitroLine® 7500 KF trace, the data transmission parameters of the titrator and the balance must correspond to each other. Additionally, it is necessary to carry out some more standard settings on the side of the balances:

- The balance is to send the balance data via RS-232-C only by means of a print command.
- The balance is to send the balance data only after the display standstill.
- The balance should never be set to 'automatic sending' and/or 'send continuously'.
- 'Handshake' on the balance must be set to 'off', or even 'Software Handshake' or 'Pause'.
- No special characters such as **S** or **St** are allowed to be used as prefix in the balance data of the balance data string. In such a case it might be possible that the TitroLine® 7500 KF trace cannot process the balance data correctly.

After you have connected the balance with the appropriate cable to the TitroLine® 7500 KF trace and have adjusted all settings in the balance software, and possibly in the TitroLine® 7500 KF trace, you can now test the data transfer of the balance very easily. Start the method. After conditioning, press Enter to start the sample titration. Confirm the sample ID. Then, the display asks you:

- a) To press the print-button at the balance → Parameters to 'weighted sample automatically'
- b) To enter the weighted sample → then the parameters are still set to 'weighted sample manually'

Put an object onto the balance and press the print button. After the standstill of the balance display there will be beep at the TitroLine® 7500 KF trace and the transmitted balance data appear:

- a) After approx. 5 sec. in the display and the display changes automatically into the measuring display.
- b) The weighted sample must again be confirmed with <Enter> or <F1>.

7.2 Balance data editor

Pressing the die **<F5/balance symbol >** function key will invoke the so-called balance data editor. A list with the existing balance data will appear:

List of balance data				
3 Weights				
002	M	10.42980	g	13:59:57
003	M	0.87360	g	14:00:10
004	M	4.37650	g	14:00:21

Selection ▲▼

Enter OK

Back ESC

20 ml NaOH 0.1 mol/L 09/13/11 14:00

Fig. 93

The balance data can be edited one by one. Following a change, a cross will appear opposite the weighed-in quantity:

List of balance data				
3 Weights				
002	M	10.42980	g	13:59:57
003	*M	0.86360	g	14:00:10
004	M	4.37650	g	14:00:21

Selection ▲▼

Enter OK

Back ESC

20 ml NaOH 0.1 mol/L 09/13/11 14:00

Fig. 94

Weights may be deleted or added individually. It is also possible to delete all weights at one stroke.

Balance data	
003 *M 0.86360 g	
Edit weight	
Delete weight	
Add weight	
Delete all?	

Selection ▲▼

Enter OK

Back ESC

20 ml NaOH 0.1 mol/L 09/13/11 14:01

Fig. 95

If no balance data is available, the "No balance data found" message will appear:

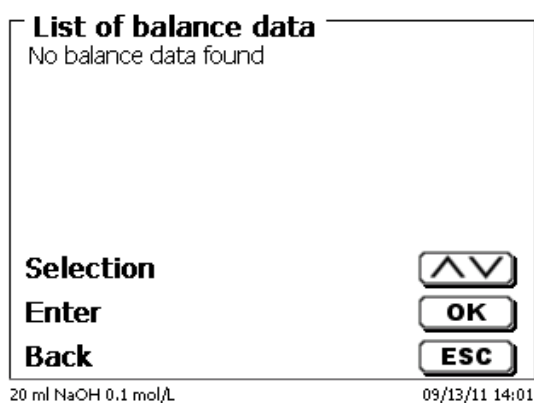


Fig. 96

7.3 Connection of Printers

The results, calibration data and methods can be printed on the following media:

- HP PCL compatible printer (A4), color printers
- HP PCL compatible printer (A4), monochrome printers
- Seiko DPU S445 (Thermo paper 112 mm width)
- On the USB stick in PDF- and CSV-format

To connect the printers to the burette please use the USB socket. When printing, please check whether the correct printer is connected. It is not possible to print „HP“printer layouts on another thermal printer or vice versa. The printer settings should always be checked and adjusted after changing the printer.

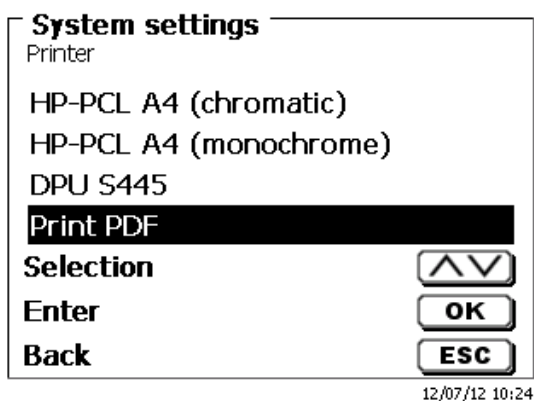


Fig. 97

Only one printer should be connected for one Titrator because an automatic printer recognition is not activated. Print PDF is the default setting. If you select "Print PDF", please make sure that a USB stick is connected to the device.

8 Maintenance and Care of the TitroLine® 7500 KF trace

To maintain the functional capability of the titrator TitroLine KF trace it is necessary to carry out all testing and maintenance works.

Wear Notes

Generator electrode

When the generating electrode is heavily soiled a cleaning with HNO₃ (65 %) is recommended. Rinse the electrode with dest. water and alcohol afterwards and let it dry in a cabinet dryer at 80 °C. Please read also the operating instructions of the generator electrodes!

Interruptions of use

- If the TitroLine® 7500 KF trace is not used for a longer time (> 2 weeks) it is recommended to remove the liquids from the titration vessel and if necessary from the generating electrode. Rinse the titration vessel and electrodes with distilled water and alcohol afterwards and let it dry in a cabinet dryer at 80 °C.
- When the titration vessel is heavily soiled it can be cleaned with a standard laboratory detergent. Rinse the titration vessel and electrodes with dest. water and alcohol afterwards and let it dry in a cabinet dryer at 80 °C.

Cleaning

- The titrator TitroLine® 7500 KF trace is to be cleaned with a wet cloth and common household cleaning agents.
- Both under and back side must be treated dry. The liquid must not enter the housing of the titrator TitroLine® 7500 KF trace.

9 Storage and transportation

If the titrator TitroLine® 7500 KF trace or the interchangeable units have to be stored over some time, or to be dislocated, the use of the original packing will be the best protection of the devices. However, in many cases this packing will not be available anymore, so that one will have to compose an equivalent packaging system. Sealing the lower section in a foil is hereby recommended.

The devices should be stored in a room with a temperature between +10 and +40°C, and the (relative) humidity of the air should not exceed 70 %.

If the interchangeable have to be stored over some time, or to be dislocated, the fluids inside the system, especially aggressive solution have to be removed (please refer also to chapter 8. „Maintenance and Care of the burette”).

10 Recycling and Disposal

The present piston burette and its packaging are manufactured as far as possible from materials which can be disposed of environmental-friendly and recycled in a technically appropriate manner.

Please note: The main printed board carries a lithium battery. Batteries should not to be disposed of with the normal domestic waste. They will be taken back and recycled or disposed of properly by the manufacturer at no cost.

Should you have any questions regarding disposal, please contact SI Analytics.

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Notes:

